

53
4 set

VOL. XII, SEC. C, No. 3

SCIENTIFIC LIBRARY
INSTITUTE OF SCIENCE
(Formerly Bureau of Science)
Manila

MAY, 1917

THE PHILIPPINE JOURNAL OF SCIENCE

ALVIN J. COX, M. A., PH. D.
GENERAL EDITOR

SECTION C. BOTANY

E. D. MERRILL, M. S.
EDITOR

WITH THE COÖPERATION OF

W. H. BROWN, PH. D.; E. B. COPELAND, PH. D.
F. W. FOXWORTHY, PH. D.; L. M. GUERRERO, PHAR. D.
R. C. MCGREGOR, A. B.



MANILA
BUREAU OF PRINTING
1917

PUBLICATIONS FOR SALE BY THE BUREAU OF SCIENCE, MANILA, PHILIPPINE ISLANDS

ETHNOLOGY

A VOCABULARY OF THE IGOROT LANGUAGE AS SPOKEN BY THE BONTOC IGOROTS

By WALTER CLAYTON CLAPP

Order No. 408. Paper, 89 pages, \$0.75, postpaid.

The vocabulary is given in Igorot-English and English-Igorot.

THE NABALOI DIALECT

By OTTO SCHEERER

and

THE BATAKS OF PALAWAN

By EDWARD Y. MILLER

Order No. 403. Paper, \$0.25; half morocco, \$0.75; postpaid.

The Nabaloi Dialect (65 pages, 29 plates) and the Bataks of Palawan (7 pages, 6 plates) are bound under one cover.

THE BATAN DIALECT AS A MEMBER OF THE PHILIPPINE GROUP OF LANGUAGES

By OTTO SCHEERER

and

"F" AND "V" IN PHILIPPINE LANGUAGES

By CARLOS EVERETT CONANT

Order No. 407.

These two papers are issued under one cover, 141 pages, paper, \$0.80, postpaid.

THE SUBANUNS OF SINDANGAN BAY

By EMERSON B. CHRISTIE

Order No. 410. Paper, 121 pages, 1 map, 29 plates, \$1.25, postpaid.

Sindangan Bay is situated on the northern coast of Zamboanga Peninsula. The Subanuns of this region were studied by Mr. Christie during two periods of five and six weeks, respectively.

The 29 plates illustrate the Subanuns at work and at play; their industries, houses, altars, and implements; and the people themselves.

THE HISTORY OF SULU

By NAJEEB M. SALEEBY

Order No. 406. Paper, 275 pages, 4 maps, 2 diagrams, \$0.75, postpaid.

In the preparation of his manuscript for *The History of Sulu*, Doctor Saleeby spent much time and effort in gaining access to documents in the possession of the Sultan of Sulu. This book is a history of the Moros in the Philippines from the earliest times to the American occupation.

ETHNOLOGY—Continued

STUDIES IN MORO HISTORY, LAW, AND RELIGION

By NAJEEB M. SALEEBY

Order No. 405. Paper, 107 pages, 16 plates, 5 diagrams, \$0.25; half morocco, \$0.75; postpaid.

This volume deals with the earliest written records of the Moros in Mindanao. The names of the rulers of Magindanao are recorded in five folding diagrams.

NEGRITOS OF ZAMBALES

By WILLIAM ALLAN REED

Order No. 402. Paper, 83 pages, 62 plates, \$0.25; half morocco, \$0.75; postpaid.

Plates from photographs, many of which were taken for this publication, show ornaments, houses, men making fire with bamboo, bows and arrows, dances, and various types of the people themselves.

INDUSTRIES

PHILIPPINE HATS

By C. B. ROBINSON

Order No. 415. Paper, 66 pages, 8 plates, \$0.50 postpaid.

This paper is a concise record of the history and present condition of hat making in the Philippine Islands.

THE SUGAR INDUSTRY IN THE ISLAND OF NEGROS

By HERBERT S. WALKER

Order No. 412. Paper, 145 pages, 10 plates, 1 map, \$1.25, postpaid.

Considered from the viewpoint of practical utility, Mr. Walker's *Sugar Industry in the Island of Negros* is one of the most important papers published by the Bureau of Science. This volume is a real contribution to the subject; it is not a mere compilation, for the author was in the field and understands the conditions of which he writes.

A MANUAL OF PHILIPPINE SILK CULTURE

By CHARLES S. BANKS

Order No. 413. Paper, 53 pages, 20 plates, \$0.75, postpaid.

In *A Manual of Philippine Silk Culture* are presented the results of several years' actual work with silk-producing larvae together with a description of the new Philippine race.

THE PHILIPPINE JOURNAL OF SCIENCE

C. BOTANY

VOL. XII

MAY, 1917

No. 3

TWO NEW GENERA AND FOUR NEW SPECIES OF PHILIPPINE COMPOSITAE

By E. D. MERRILL¹

(From the Botanical Section of the Biological Laboratory, Bureau of
Science, Manila, P. I.)

TWO PLATES

In view of the facts that the *Compositae* is a family represented in the Philippines and in the Malayan region generally by comparatively few genera and species; that few of the genera are confined to this particular region; and that a high percentage of the species are manifestly introduced ones here, it is rather surprising that our recent collections should present two apparently undescribed generic types from the Philippines. There are recorded to-day from the Philippines about one hundred forty species of *Compositae*, of which but about 35 per cent are endemic. In this family it is now comparatively rare that either new species or those previously described from extra-Philippine material are discovered in the Archipelago.

In the present paper I present descriptions and figures of two new genera, while for convenience I add the descriptions of two other new species in the well-known genus *Gynura* and record two representatives of other genera as new to the Philippine flora. The drawings accompanying the present paper were made by Mr. J. K. Santos, assistant in the botanical department, College of Liberal Arts, University of the Philippines.

GUERREROIA genus novum

(*Heliantheae-Coreopsidinae*)

Capitula heterogama, radiata, floribus radii paucis (4 vel 5) ♀ sterilibus discique ♂ fertilibus. Involucrum parvum, bracteis 2-seriatis, basi brevissime connatis, parum inaequalibus, additis

¹ Professor of botany, University of the Philippines.

binis exterioribus minimis. Receptaculum planum, paleis angustis scariosis planis oblongis medio lineatis flores ♂ omnes subtendentibus onustum. Corollae ♀ ligulatae, lamina patente, grosse 2-dentata, obovata; ♂ regulares, tubulosae, limbo 4-fido, anguste campanulato. Antherae 4, basi obtusae. Styli rami in appendices subulatas desinentes. Achenia lineari-oblonga, a dorso compressa, leviter incurva utrinque leviter carinata vel-costata, haud alata, calva, disco epigyno minuto coronata.—Herba perennis glabra, subacaulis, stolonifera, caudice brevissimi. Folia ad caudicem vel ad apices ramorum brevissimum conferta, oblongo-ovovata, longe petiolata, apice prominente 3- vel 5-dentata, deorsum gradatim angustata, basi cuneata. Capitula parvula, in pedunculo scapiformi aphylo solitaria. Ligulae flavae.

GUERREROIA MONOCEPHALA sp. nov. Plate II.

Herba subglabra, subacaulis, perennis; foliis numerosis, subrosulatis, longe petiolatis, oblongo-obovatis, 1 ad 2 cm longis, apice prominente 3- vel 5-dentatis, rotundato-subtruncatis, deorsum cuneatim angustatis; capitulis solitariis, longe pedunculatis, multifloris, 10 ad 12 mm diametro; acheniis anguste oblongis, glabris, circiter 4 mm longis.

A nearly glabrous, perennial, subacaulescent herb, the very short caudex woody, thickened, bearing from one to several tufts of radiately arranged leaves on the very short stout branches, also emitting stolons up to 5 cm in length, each stolon in turn bearing a terminal tuft of leaves, the petioles sparingly pilose at the very base. Leaves numerous, all subrosulately crowded on the very short caudices, their petioles slender, 1.5 to 4 cm in length, the blades oblong-obovate, chartaceous to subcoriaceous 1 to 2 cm long, 5 to 7 mm wide, the subtruncately rounded apex prominently 3- or 5-toothed, the teeth triangular, acute, gradually narrowed from the apex to the base, cuneate. Peduncles solitary, 5 to 10 cm long, each bearing a single head, the heads 10 to 12 mm in diameter, the outer two bracteoles linear, about 1.5 mm long, free, the inner ones 2-seriate, subequal, about 10 in number, slightly united at the base, glabrous, oblong, obtuse, about 3 mm long. Ray flowers about 4, yellow, the tube 1.5 mm long, the limb broadly obovate, 4 to 4.5 mm long, 3.5 to 4 mm wide, prominently 5-nerved, apex coarsely 2-toothed; style slightly exerted from the tube, the arms 0.5 mm long or less. Achenes sterile, flattened, about 1 mm long, slightly 2-toothed at the apex. Paleae subtending the disk flowers flat, oblong, obtuse, 3 mm long. Corolla 3 to 3.5 mm long, the tube 2 to 2.5 mm long,

the limb somewhat campanulate, the lobes 4, ovate, obtuse, 1 mm long or less; style-arms 1.5 to 2 mm long. Achenes, in anthesis, flattened, about 1 mm long, when mature slightly curved, smooth, glabrous, flattened, slightly curved, narrowly oblong, about 4 mm long and 1 mm wide, rather distinctly keeled inside and obscurely so outside, slightly narrowed at the tip and crowned with the very minute obscure corona.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27526 Ramos, March 9, 1917, on dry open hills at low altitudes, "flowers white and yellow."

The alliance of this new genus is with *Chrysanthellum* and *Glossogyne*, but it differs radically from both of these in many characters. It is distinguished from both in being nearly acaulescent and stoloniferous, and in its solitary, long-peduncled heads. Among other characters it differs from *Glossogyne* in its unawned achenes and from *Chrysanthellum* in being perennial, unbranched or with but the very short thickened branches of the caudex, in its solitary, long-peduncled heads, crowded, subsessile, long-petioled leaves, and other characters. The long-petioled leaves, which are oblong-obovate in outline, subtruncate and prominently 3- or 5-toothed at the apex, and cuneately narrowed below, are very characteristic.

The new genus is dedicated to Dr. Leon Ma. Guerrero in commemoration of his knowledge of Philippine pharmacy and botany and his deep interest in the study of our local medicinal plants.

FENIXIA genus novum

(*Heliantheae-Verbesinae*)

Capitula heterogamia, radiata, floribus radii ♀ 2, sterilibus, disci 5, ♀ fertilibus. Involucrum anguste campanulatum, bracteis 6, 2-seriatis, herbaceis, lanceolatis, acuminatis, hirsutis, interioribus brevioribus. Receptaculum minimum, convexiusculum vel subplanum, glabrum, nudum. Corollae ♀ ligulatae, patentes, laminis obovatis, 3-dentatis; ♂ regulares, tubulosae, limbo breviter 4-fido. Antherae 4, basi breviter 2-dentatae. Styli rami complanati, acuminati. Achenia compressa, oblongo-obovata, crasse bialata, rugosa, sursum leviter hirsuta, margine irregulariter crenata, apice obtusa, calva.—Herba annua, ramosa, strigosa. Folia opposita, subovata, acute serrata. Capitula parva, pauciflora, in axillis foliorum tenuiter pedunculata, pedunculis solitariis. Corollae radii flavae. Achenia indurata, rugosa, apice plus minusve hirsuta.

FENIXIA PAUCIFLORA sp. nov. Plate III.

Herba erecta vel suberecta, ramosa, usque ad 40 cm alta, hirsuto-strigosa, ramis ramulisque tenuibus; foliis oppositis, membranaceis, subovatis, usque ad 2.5 cm longis, acutis vel obscure acuminatis, basi late subrotundatis ad subacutis, nervis utrinque 2 vel 3; obscuris; capitulis in axillis superioribus, solitariis, paucifloris, tenuiter pedunculatis, anguste campanulatis,

circiter 8 mm longis, floribus flavis, concoloribus; bracteis 6, 2-seriatis, strigoso-hirsutis, membranaceis, lanceolatis, acumina-tis, exterioribus 5 ad 6 mm longis, interioribus brevioribus; flo-ribus ♀ 2, ligulatis, 7 ad 8 mm longis ♂ tubulosis, circiter 5 mm longis, breviter 4-fidis, extus parce hirsutis; acheniis oblongo-obovatis, induratis, 3.5 ad 4 mm longis, in siccitate brunneis, rugosis, obtusis, apicem versus plus minusve hirsutis, calvis, prominente bialatis, alis crassis, margine irregulariter crenatis.

MINDANAO, Bukidnon Subprovince, Gaboc, Tanculan, *Bur. Sci.* 26036 *Eugenio Fénix*, July 13, 1916, on damp rocky hillsides associated especially with *Begonia*.

This genus is anomalous in the *Heliantheae-Verbesinae* in that the receptacle is entirely destitute of paleae, but in spite of this, its alliance is apparently with *Eclipta*. In *Eclipta* the paleae of the receptacle are very slender, and are frequently entirely absent among the central flowers of the head. It is probable that the absence of paleae in the present genus may be due to the great reduction of the heads, there being but two sterile pistillate flowers and five perfect fertile flowers in each head. The indurated rugose achenes somewhat resemble those of *Eclipta*, differing in shape and in the prominent, thick, marginal wings.

The genus is dedicated to Mr. Eugenio Fénix, who collected the specimens and who for about fifteen years has been a most efficient assistant in the herbarium of the Bureau of Science.

GYNURA Cassini

GYNURA SUBGLABRA sp. nov.

Scandens, inflorescentiis leviter castaneo- vel subferrugineo-pubescentibus exceptis glabra, ramis prominente 4- vel 5-angulatis; foliis membranaceis ad chartaceis, in siccitate atro-brunneis, usque ad 17 cm longis, acuminatis, sessilibus, basi biauriculatis, margine irregulariter dentatis; inflorescentiis axillaribus terminalibusque, longe pedunculatis; capitulis circiter 1.5 cm longis, multifloris; bracteolis circiter 10, glabris, lineari-lanceolatis, acuminatis, circiter 12 mm longis.

A coarse scandent plant entirely glabrous except the more or less castaneous- or subferruginous-pubescent inflorescences. Branches stout, brown, prominently 4- or 5-angled, 5 to 8 mm in diameter. Leaves sessile, membranaceous to chartaceous, dark-brown when dry, dull or slightly shining, oblong to oblong-ovate, 9 to 17 cm long, 4 to 6 cm wide, margins rather coarsely dentate, apex acuminate, base somewhat narrowed and prominently biauriculate, the auricles irregular, angled or toothed, 1 to 2 cm long, in general ovate or rhomboid-ovate. Inflorescences axillary and terminal, long-peduncled, each with 6 to 12 heads of yellow flowers, the peduncles up to 20 cm in length, the

younger branchlets pubescent, otherwise glabrous. Heads about 1.5 cm long, each peduncle with several, scattered, filiform bracts usually about 5 mm in length. Bracteoles about 10, linear-lanceolate, acuminate, about 12 mm long, glabrous. Achenes glabrous.

LUZON, Abra Province, Mount Posuey, *Bur. Sci.* 27023 Ramos, February 4, 1917, climbing over shrubs on damp forested slopes.

In many respects this species resembles *Gynura bicolor* DC. and *G. angulosa* DC., but differs from both in being scandent, not erect, and from the former in its sessile, not petioled leaves.

GYNURA ACUMINATISSIMA sp. nov.

Erecta, glabra, usque ad 50 cm alta; foliis lanceolatis, membranaceis, longissime acuminatis, basi decurrento-acuminatis, usque ad 20 cm longis et 4 cm latis, margine distanter irregulariter dentatis vel denticulatis, nitidis; inflorescentiis laxis, corymbosis, ramis elongatis; capitulis circiter 1.5 cm longis, bracteolatis, bracteis lineari-lanceolatis, circiter 12 mm longis.

An erect glabrous or nearly glabrous plant, attaining a height of 50 cm, the stems below attaining a diameter of 5 mm, terete, brown. Leaves somewhat crowded on the lower part of the stem, lanceolate, membranaceous, brownish when dry, shining, 17 to 20 cm long, 3 to 4 cm wide, gradually narrowed upward to the long and slenderly acuminate apex, the base decurrent-acuminate, the margins distantly and irregularly toothed, or sometimes merely denticulate, the smaller reduced leaves subtending the branches sessile, often lacinate-lobed in the lower part, the petioles of the normal leaves 2 to 4 cm long. Inflorescence corymbose, lax, the branches slender, elongated, up to 20 cm long, each primary branch bearing two or three heads on long, slender, slightly pubescent branchlets. Heads about 1.5 cm long, each subtended by about 10, linear, glabrous, 6 mm long bracteoles. Involucral bracts linear-lanceolate, glabrous, about 3 mm wide and 12 mm long, glabrous. Flowers numerous, yellow. Corolla-tube slender, about 12 mm long, the upper 2 mm of the tube somewhat inflated, the lobes 2 mm long, slightly pubescent at their tips. Achenes cylindric, ribbed, 3 mm long. Pappus copious, white, 8 to 10 mm long. Disk conspicuously alveolate, the margins of the alveolae produced, scale-like, about 0.5 mm long.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci.* 26556 Ramos & Edaño, August 26, 1916, on slopes at medium altitudes.

A most characteristic species, readily distinguished from its congeners in its glabrous, lanceolate, very slenderly acuminate leaves.

PTEROCAULON Elliott

PTEROCAULON REDOLENS (Forst.) F.-Vill. Novis. App. (1880) 116;
Boerl. Handl. Kenn. Fl. Nederl. Ind. 2¹ (1891) 240.

Gnaphalium redolens Forst. Prodr. (1786) 91.

Conyza redolens Willd. Sp. Pl. 3 (1800) 1951.

Moneteles redolens DC. Prodr. 5 (1836) 455.

Moneteles spicatus Labill. Sert. Austro-Caledon. (1824) 43; t. 43.

Tessaria redolens Less. in Linnaea 6 (1831) 151.

Gnaphalium cylindrostachyum Wall. Cat. (1831) no. 3931, nomen nudum.

Sphaeranthus elongatus Blanco Fl. Filip. (1837) 636.

Pterocaulon cylindrostachyum C. B. Clarke Comp. Ind. (1876) 98.

Tessaria redolens Less. was credited to Luzon in Linnaea 6 (1831) 151, the reference to Chamisso's specimen being repeated in de Candolle's Prodr. under *Moneteles redolens* DC. I do not see, from the descriptions available, how *Gnaphalium redolens* Forst. can be distinguished from the species more commonly known as *Pterocaulon cylindrostachyum* C. B. Clarke, and have accordingly accepted *Pterocaulon redolens* (Forst.) F.-Vill. as the proper name for the species, which is of local occurrence in the Philippines, growing in open dry places at low altitudes. This is one of the numerous transfers made by F.-Villar in the Novissima Appendix to the third edition of Blanco's Flora de Filipinas that were overlooked by the compilers of Index Kewensis.

ARTEMISIA Linnaeus

ARTEMISIA JAPONICA Thunb. Fl. Jap. (1784) 310.

LUZON, Ilocos Norte Province, Bangui, Bur. Sci. 27500 Ramos, February 26, 1917, in dry open places at low altitudes.

The specimen is scarcely typical *Artemisia japonica* Thunb., but apparently represents a form of this species. Japan to Formosa and southern China.

ILLUSTRATIONS

[Drawings by J. K. Santos.]

PLATE II. *Guerreroia monocephala* Merr. •

- a. Habit sketch of a flowering plant, natural size.
- b. Anthers. $\times 20$.
- c. Involucral bract. $\times 5$.
- d. Palea. $\times 5$.
- e. Disk flower. $\times 5$.
- f. Ray flower. $\times 5$.
- g. Stigma. $\times 20$.
- h. Achenes. $\times 4.5$.

III. *Fenixia pauciflora* Merr.

- a. Habit sketch. $\times 0.5$.
- b. A leaf, natural size.
- c. A head in anthesis. $\times 3$.
- d. A ray flower. $\times 4$.
- e. A disk flower. $\times 4$.
- f. Stigma. $\times 20$.
- g. Anthers. $\times 20$.
- h. Achenes, dorsal and ventral views. $\times 4$.
- i. A head in fruit. $\times 3$.



PLATE II. GUERREROIA MONOCEPHALA MERR.



PLATE III. FENIXIA PAUCIFLORA MERR.

NEW PHILIPPINE LAURACEAE

By E. D. MERRILL¹

(From the Botanical Section of the Biological Laboratory, Bureau of
Science, Manila, P. I.)

The present paper consists chiefly of the descriptions of nineteen species of *Lauraceae* in the genera *Cinnamomum*, *Cryptocarya*, *Litsea*, and *Phoebe*, with a note on *Litsea albayana* Vid.; *Cryptocarya griffithiana* Wight is credited to the Philippines, and *Endiandra vidalii* Elm. is transferred to *Cryptocarya* where it properly belongs.

CINNAMOMUM Linnaeus

CINNAMOMUM MYRIANTHUM sp. nov.

Arbor parva, haud aromatica, inflorescentiis exceptis glabra; ramis ramulisque teretibus, laevis, brunneis; foliis oppositis, coriaceis, ovatis ad oblongo-ovatis, usque ad 11 cm longis, obtusis vel brevissime obtuse acuminatis, basi acutis, prominente triplinerviis, nervis apice non attingentibus, supra laevis, nitidis, subtus distincte dense jejeune foveolato-reticulatis; paniculis terminalibus, circiter 15 cm longis, multifloris, plus minusve adpresse griseo-pubescentibus; floribus pedicellatis, 5 mm longis, segmentis extus prominente, pubescentibus, indumentum nitidum; staminibus fertilibus 9, circiter 3 mm longis, staminoideis stipitatis, lanceolatis, acuminatis.

A tree about 5 m high, glabrous except the rather prominently pubescent inflorescence, the leaves and the cortex of the younger branches not at all aromatic when dry. Branches and branchlets brown, terete, smooth. Leaves opposite, coriaceous, ovate to oblong-ovate, 8 to 11 cm long, 4 to 5.5 cm wide, narrowed upward to the obtuse or shortly and obtusely acuminate apex, base acute, prominently 3-plinerved, the upper surface smooth, shining, rather pale when dry, the lower surface of nearly the same color, duller, distinctly and densely foveolate-reticulate, the foveolae shallow, mostly about 0.5 mm in diameter; lateral nerves leaving

¹ Professor of botany, University of the Philippines.

the midrib about 1 cm above the base, evanescent or obscurely anastomosing with a supplementary pair of lateral nerves leaving the midrib above the middle of the leaf at about three-fourths the length of the leaf, not reaching the apex; sometimes a very faint additional pair of basal nerves close to the margin is present; petioles reddish-brown or brown, 1.5 cm long. Panicles terminal, ample, many flowered, up to 15 cm in length, the rachis and primary branches sparingly pubescent, the younger branchlets, pedicels, and perianth-segments prominently appressed-pubescent with pale or grayish, shining hairs; pedicels 3 to 6 mm long. Flowers about 5 mm long, the tube 1.8 mm long. Perianth-segments elliptic-oblong, obtuse, 3 to 4 mm long. Fertile stamens 9, about 3 mm long, the filaments pubescent below, the third row with prominent glands at about the middle of the filaments; staminodes stipitate, lanceolate, acuminate. Ovary ellipsoid, glabrous; style 2 mm long.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27485 Ramos, February 22, 1917, in forests at low altitudes, Il. *pellings*.

This species is characterized among the Philippine forms by being non-aromatic, in its prominently triplinerved leaves, the basal nerves attaining about the upper three-fourths of the leaf; and its leaves being distinctly but shallowly foveolate-reticulate on the lower surface. In general aspect it somewhat resembles *Cinnamomum zeylanicum* Nees, but is not closely allied to that species.

CINNAMOMUM SANDKUHLII sp. nov. § *Malabathrum*.

Arbor, ramulis foliis junioribus et inflorescentiis dense molliter griseo-pubescentibus; foliis oppositis vel suboppositis, coriaceis, oblongis ad oblongo-ellipticis, usque ad 18 cm longis, nitidis, basi acutis, prominente 3-plinerviis, apice obtusis vel subacutis; paniculis circiter 20 cm longis, floribus circiter 4 mm longis.

A tree, the younger branchlets, lower surfaces of the leaves, and the inflorescence densely and softly gray-pubescent, the indumentum also present on the upper surface of the leaves, more or less deciduous, the very old leaves glabrous on both surfaces. Branches terete, reddish-brown, glabrous. Leaves opposite or subopposite, thickly coriaceous, oblong-elliptic, 10 to 18 cm long, 3.5 to 6.5 cm wide, base acute, apex obtuse to acute, the upper surface very smooth and shining, the lower dull at first, in age shining; base prominently 3-plinerved, the midrib and basal nerves very prominent on both surfaces, the basal pair extending nearly to the apex of the leaf, with transverse nervules between the midrib and the lateral nerves, but without primary nerves; petioles up to 1.5 cm long, densely pubescent when young, in age quite glabrous. Panicles in the upper axils,

about 20 cm long, rather densely and softly gray-pubescent. Buds obovoid. Flowers about 4 mm long, externally densely pubescent, the perianth lobes oblong-obovate, rounded. Stamens 9, all 4-celled. Ovary glabrous, ovoid; style about 1 mm long.

LUZON, Benguet Subprovince, Baguio, *For. Bur.* 21289 Sandkuhl, April, 1914, a single tree in Forbes Park, altitude about 1,400 meters.

A species well characterized by its soft dense indumentum, in this character differing from all known Philippine forms. Its alliance seems to be with *Cinnamomum mollissimum* Hook. f. of the Malay Peninsula from which it is readily distinguished by its acute or obtuse, not acuminate leaves, glabrous ovary, and many other characters.

CRYPTOCARYA R. Brown

CRYPTOCARYA LANCEOLATA sp. nov.

Arbor parva inflorescentiis et ramulis junioribus minute cinereo-puberulis exceptis glabra; foliis subcoriaceis, lanceolatis, nitidis, usque ad 17 cm longis, basi acutis, apice gradatim angustatis; leviter acuminatis, nervis utrinque circiter 7, adscendentibus, curvatis, vix anastomosantibus, reticulis tenuibus, confertis, subtus jejeune foveolatis; infructescentibus terminalibus et in axillis superioribus, usque ad 10 cm longis, cinereo-puberulis; fructibus globosis vel globoso-ovoideis, glabris, nitidis, laevis, circiter 12 mm diametro, in siccitate nigris vel olivaceo-nigris.

A small tree, the young branchlets and inflorescence cinereous-puberulent, otherwise glabrous. Branches somewhat olivaceous and slightly wrinkled when dry. Leaves alternate, lanceolate, subcoriaceous, shining, 10 to 17 cm long, 2.5 to 5 cm wide, the upper surface grayish-olivaceous, very smooth, and prominently shining, the lower paler, base acute, apex obscurely acuminate, gradually narrowed upward from the lower one-third or one-half; lateral nerves about 7 on each side of the midrib, ascending, curved, scarcely anastomosing, distinct, the ultimate reticulations close, fine, the lower surface shallowly foveolate; petioles 3 to 6 mm long, when young cinereous-puberulent. Panicles in the uppermost axils and terminal, forming a somewhat leafy terminal inflorescence, up to 10 cm in length. Fruit globose or globose-ovoid, about 12 mm in diameter, black or olivaceous when dry, smooth, glabrous, shining.

LUZON, Ilocos Norte Province, Buagao, *For. Bur.* 25098 Paraiso, February 21, 1916, on slopes at an altitude of about 100 meters.

A species well characterized by its lanceolate leaves, with rather distant, ascending, curved nerves, and very close ultimate reticulations which are shallowly foveolate on the lower surface.

CRYPTOCARYA CINNAMOMIFOLIA sp. nov.

Arbor parva, novellis ferrugineo-pubescentibus exceptis glabra, ramis ramulisque tenuibus, teretibus, rubro-brunneis; foliis firmiter chartaceis, oblongis, usque ad 15 cm longis, prominente tenuiter acuminatis, basi acutis, 3-plinerviis, nervis longitudinalis prominentibus apice subattingentibus, transversis tenuibus, obscuris; inflorescentiis axillaribus, solitariis, racemosis, paucifloris, 2 ad 3 cm longis; floribus circiter 6 mm longis.

A small tree, 5 m high according to the collector, entirely glabrous except the ferruginous-pubescent buds, a few hairs sometimes persisting on the youngest branchlets. Branches and branchlets slender, terete, smooth, reddish-brown. Leaves longitudinally 3-ribbed, oblong, firmly chartaceous, 8 to 15 cm long, 2.8 to 5.5 cm wide, shining, smooth, the upper surface brownish or grayish-olivaceous, the lower paler, the apex prominently and slenderly acuminate, the base acute, prominently 3-plinerved, the longitudinal nerves extending nearly to the apex; lateral transverse nerves very slender, obscure, irregular, straight, anastomosing with the longitudinal ones, the reticulations lax, obscure, or nearly obsolete; petioles about 1 cm long. Racemes axillary, solitary, 2 to 3 cm long, each 4- to 6-flowered, glabrous or nearly so, the pedicels 2 to 3 mm long. Flowers greenish-yellow. Perianth-tube 2.5 mm long, somewhat cuneate, the lobes 6, oblong, obtuse, 3 mm long. Stamens 9, their filaments very slightly pubescent, about 2 mm long, the anthers all 2-celled; stipitate glands prominent, about 1.5 mm long. Ovary narrow, including the style 4.5 mm in length.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26317 Ramos & Edaña, August 6, 1916, on forested slopes at low altitudes.

This species, in general appearance, differs so radically from the other forms of *Cryptocarya* known to me that I have hesitated in placing it in this genus. Its notable characters are its 3-plinerved, longitudinally ribbed, *Cinnamomum*-like leaves, and its short, few-flowered, axillary racemes. In floral structure, however, it seems to conform to *Cryptocarya*, and I have accordingly placed it in this genus.

CRYPTOCARYA OLIGOPHLEBIA sp. nov.

Arbor circiter 18 m alta, ramulis inflorescentisque plus minusve breviter pubescentibus, subtus foliis ad costa nervisque parcissime pubescentibus; foliis oblongo-ovatis, chartaceis vel subcoriaceis, olivaceis, nitidis, usque ad 12 cm longis, basi acutis ad rotundatis, sursum sensim angustatis, acuminatis, nervis utrinque 3 vel 4; paniculis axillaribus terminalibusque, multifloris, usque ad 15 cm longis, floribus in ramulis ultimis plus minusve confertis, circiter 4 mm longis, extus pubescentibus.

A tree about 18 m high, the branches and branchlets rather slender, terete, dark when dry, the younger ones sparingly pubescent with short hairs. Leaves chartaceous to subcoriaceous, oblong-ovate, dark-olivaceous on both surfaces when dry, the lower slightly paler than the upper, 9 to 12 cm long, 3 to 5 cm wide, base acute to somewhat rounded, gradually narrowed upward from the lower one-third or one-half to the acuminate apex, the acumen blunt; both surfaces, or the lower one only, very sparingly appressed-pubescent on the midrib and nerves, the ultimate reticulations shallowly foveolate, dense, about equally prominent on both surfaces; lateral nerves 3 or 4 on each side of the midrib, curved-ascending, slender but distinct; petioles somewhat pubescent, about 5 mm long. Panicles terminal and axillary, ample, many flowered, up to 14 cm long, the branches alternate, spreading or somewhat ascending, the lower ones up to 6 cm long. Flowers white, numerous, somewhat crowded on the ultimate branchlets, the younger parts of the inflorescence and the flowers rather prominently pale-brownish-pubescent. Flowers about 4 mm long, the tube cylindric, slightly inflated, about 1.8 mm long, the lobes slightly longer than the tube, ovate to oblong-ovate, obtuse to subacute, externally pubescent.

BASILAN, *Bur. Sci.* 16155 Reillo, August 19, 1912 (type), *For. Bur.* 18883, 18844 Miranda, August, 1912, in forests, altitude 20 to 200 meters.

A species well characterized by its few-nerved leaves and its ample, many-flowered panicles; it is quite different from all other species known to me. Perhaps two of the specimens cited above are from the small island of Malamaui, near Basilan, judging from the field labels. *Bur. Sci.* 16155 Reillo and *For. Bur.* 18883 Miranda were both collected on August 19, and both indicated as from Basilan, but the latter bears the additional statement "from the forests of Malamaui."

CRYPTOCARYA OBLONGATA sp. nov.

Arbor, partibus junioribus subtus foliisque ad costa nervisque minute adpresse ferrugineo-pubescentibus; foliis coriaceis, oblongis, usque ad 14 cm longis, apice breviter acuminatis, basi cuneatis, supra glabris, laevis, leviter nitidis, olivaceis, subtus brunneis et leviter glaucescentibus, nervis utrinque 10 ad 12, suberectis, subtus valde prominentibus; paniculis axillaribus, brevibus, fructibus anguste ovoideis, nitidis, laevis, glabris, circiter 2 cm longis.

A tree, nearly glabrous (flowers not known). Branches terete, slender, dark reddish-brown when dry, glabrous, the very young branchlets pubescent. Leaves oblong, coriaceous, 8 to 14 cm long, 2 to 4 cm wide, the apex shortly acuminate, base

cuneate, the upper surface olivaceous, smooth, somewhat shining, glabrous, the lower surface brownish and slightly glaucescent when dry; lateral nerves 10 to 12 on each side of the midrib, very prominent on the lower surface, obscure on the upper surface, nearly straight, somewhat ascending, the reticulations not prominent, the midrib and lateral nerves on the lower surface minutely appressed-pubescent with short brown or reddish-brown hairs; petioles about 1 cm long, nearly black when dry, glabrous. Panicles axillary, solitary, in fruit about 2.5 cm long. Fruits narrowly ovoid, about 2 cm long, 10 to 12 mm in diameter, dark brown, smooth and shining when dry.

LUZON, Tayabas Province (Principe), Baler, Merrill 1033 (coll. Garcia), August, 1902, locally known as *pusihan*.

Apparently as closely allied to *CRYPTOCARYA VIDALII* (Elm.) (*Endiandra vidalii* Elm.) as to any other species, but with much more numerous lateral nerves and smaller fruits.

CRYPTOCARYA SAMARENSIS sp. nov.

Arbor circiter 18 m alta, subtus foliis ramulisque minute adpresse puberulis. Foliis oblongis, subcoriaceis, usque ad 11 cm longis, in siccitate utrinque brunneis, apice tenuiter acuminatis, basi acutis, nervis utrinque circiter 8, subtus prominentibus; fructibus oblongo-ellipsoideis, circiter 2.5 cm longis, utrinque leviter angustatis, in siccitate nigris, nitidis, laevis.

A tree about 18 m high, nearly glabrous, the young branchlets and the lower surfaces of the leaves minutely appressed-puberulent. Branches slender, terete, brownish. Leaves oblong, subcoriaceous, 8 to 11 cm long, 2.5 to 4 cm wide, the base acute, apex rather slenderly and sharply acuminate, both surfaces brown when dry or the upper surface brownish-olivaceous, shining, smooth; lateral nerves about 8 on each side of the midrib, prominent, curved-ascending, the reticulations slender, distinct; petioles slender, about 1 cm long. Flowers not seen. Panicles axillary, mostly 2 to 5 cm long, some up to 12 cm in length, the branches few, short, glabrous. Fruits oblong-ellipsoid, smooth, black and shining when dry, slightly and subequally narrowed at both ends, 2 to 2.5 cm long, about 1 cm in diameter.

SAMAR, Cauayan Valley, Bur. Sci. 17531 Ramos, March 27, 1914, in forests along small streams, locally known as *malaigot*.

A species somewhat resembling *Cryptocarya glauciphylla* Elm., from which it differs, among other characters, in its brown leaves which are minutely appressed-puberulent on the lower surface.

CRYPTOCARYA ZAMBOANGENSIS sp. nov.

Arbor 7 ad 12 m alta, partibus junioribus ferrugineo-pubescent-

ibus; foliis oblongis ad late oblongis, usque ad 18 cm longis, basi acutis ad rotundatis, apice latissime breviter obtuseque acuminate, subcoriaceis, subtus ad costa nervisque subdense minute pubescentibus, nervis utrinque circiter 9, prominentibus; paniculis axillaribus terminalibusque, usque ad 18 cm longis; floribus pubescentibus, circiter 5 mm longis; fructibus junioribus ovoidis, leviter pubescentibus, longitudinaliter striatis.

A tree 7 to 12 m high, the younger parts rather prominently ferruginous-pubescent with short hairs. Branches terete, reddish-brown, slightly pubescent, the young branchlets rather densely pubescent. Leaves oblong to broadly oblong, subcoriaceous, olivaceous or somewhat pale when dry, slightly shining, the lower surface browner than the upper, 11 to 18 cm long, 4 to 8 cm wide, base acute to rounded, apex rather abruptly, shortly, and very obtusely acuminate, the upper surface glabrous or somewhat pubescent on the midrib and the lateral nerves, the lower surface minutely and often rather densely pubescent on the midrib, lateral nerves, and usually the primary reticulations, in age often becoming nearly glabrous; lateral nerves about 9 on each side of the midrib, prominent, curved-ascending, usually distinctly impressed on the upper surface, the ultimate reticulations dense, shallowly foveolate on both surfaces; petioles about 1 cm long, pubescent. Panicles axillary and terminal, rather densely ferruginous-pubescent, especially the younger parts, up to 18 cm in length, often much shorter, the primary branches distant, spreading. Flowers whitish, pubescent, the perianth tube ovoid, about 2 mm long, the lobes subequal, oblong to oblong-obovate, acute, about 3 mm long. Young fruits ovoid, somewhat pubescent, about 8 mm long, obtuse, distinctly longitudinally striate.

MINDANAO, Zamboanga District, Siay River, *For. Bur.* 13395 Foxworthy, Demesa, & Villamil (type), May 29, 1912; Sax River, *Williams* 2301, February 4, 1905; Tetuan, *Ahern* 583. The native name indicated by Foxworthy is *taming-taming*; by Quadras (*Ahern* 583) *pulipup*.

A species similar to *Cryptocarya palawanensis* Merr., from which it differs essentially in its somewhat smaller, fewer-nerved leaves.

CRYPTOCARYA GRIFFITHIANA Wight Ic. (1852) t. 1830.

MINDANAO, Lanao District, Kalambugan, *For. Bur.* 23179 Agama, November 6, 1914, in forests, altitude not indicated.

The specimen agrees so closely with a rather full series of specimens representing *Cryptocarya griffithiana* Wight, from the Malay Peninsula, that I cannot detect any constant characters by which it can be distinguished and I have accordingly no hesitation in referring this Mindanao plant to Wight's species.

Tenasserim to Singapore; new to the Philippines.

LITSEA Lamarck

LITSEA ILOCANA sp. nov.

Arbor parva, ramulis junioribus et inflorescentiis ferrugineo-puberulis, ceteroquin glabra; ramis ramulisque teretibus, brunneis vel rubro-brunneis; foliis oppositis vel suboppositis, coriaceis, in siccitate pallidis, nitidis, lanceolatis, usque ad 13 cm longis, utrinque subaequaliter angustatis, basi acutis, apice obtusis vel obscure obtuseque acuminatis, nervis utrinque circiter 9, curvatis, obscure anastomosantibus; fructibus axillaribus, fasciculatis, brevissime pedicellatis, calycibus accrescentibus, circiter 8 mm diametro, fructibus oblongis ad oblongo-ellipsoideis, circiter 1.4 cm longis, minute apiculatis.

A small tree, the young branchlets, petioles, and inflorescences rather densely ferruginous-puberulent, soon becoming glabrous. Branches and branchlets terete, brown or reddish-brown. Leaves mostly opposite or subopposite, lanceolate, coriaceous, 8 to 13 cm long, 2 to 3.5 cm wide, subequally narrowed to the acute base and to the blunt or very obscurely blunt-acuminate apex, shining on both surfaces, the upper surface pale greenish when dry; lateral nerves about 9 on each side of the midrib, slender, curved, obscurely anastomosing, the ultimate reticulations fine, close, the upper surface smooth, the lower shallowly and minutely foveolate; petioles about 5 mm long. Fruits axillary, usually three developing from each very short peduncle, the very short stout pedicels not exceeding 2 mm in length. Accrescent calyx about 8 mm in diameter, brown, thickly coriaceous, obconic. Fruit oblong to oblong-elliptic, about 1.4 cm long, brown when dry, apiculate.

LUZON, Ilocos Sur Province, Talinaaden, *For Bur.* 25485 *Paraiso*, March 25, 1916, on slopes at an altitude of 450 meters.

A species belonging in the general group with *Litsea luzonica* F.-Vill., but quite different from that species in its vegetative characters.

LITSEA ABRAENSIS sp. nov.

Arbor glabra, circiter 10 m alta, ramis teretibus, ramulis in siccitate nigrescentibus, teretibus vel obscure angulatis; foliis alternis, coriaceis, oblongis ad oblongo-ellipticis, usque ad 12 cm longis, supra nitidis, laevis, viridi-olivaceis, subtus glaucescentibus, apice acute acuminatis, basi acutis, nervis utrinque circiter 8, prominentibus, curvato-anastomosantibus, reticulis tenuibus, obscuris; umbellulis 4- vel 5-floris, racemose dispositis, racemis axillaribus, 4 ad 7 cm longis; bracteis 4, extus minute parce puberulis, in siccitate nigrescentibus, concavis, orbiculari-ovatis, 7 ad 8 mm diametro; floribus glabris, segmentis oblongo-lan-

ceolatis, acuminatis, 5 mm longis, glabris vel margine obscurissime ciliatis; staminibus fertilibus 12, filamentis exterioribus eglandulosis.

A glabrous tree about 10 m high, or the younger parts obscurely and sparingly cinereous-puberulent. Branches terete, grayish-brown, rugose, the branchlets, petioles, and inflorescences characteristically black or blackish when dry. Leaves alternate, coriaceous, oblong to oblong-elliptic, 8 to 12 cm long, 3 to 5 cm wide, apex acutely acuminate, base acute, the upper surface greenish-olivaceous, the lower somewhat glaucous; lateral nerves about 8 on each side of the midrib, prominent, curved-ascending, obscurely anastomosing, the reticulations slender, not prominent, obsolete on the upper surface; petioles 1.5 to 2 cm long. Inflorescences racemose, axillary, 4 to 7 cm long, each with about 8 umbels, these with 4 to 7 mm long peduncles, 4- or 5-flowered; bracts 4, black when dry, glabrous or externally obscurely and slightly cinerous-puberulent, orbicular-ovate, concave, 7 to 8 mm in diameter. Flowers yellowish, shortly pedicelled. Perianth segments oblong-lanceolate, acuminate, about 5 mm long, glabrous or their margins obscurely ciliate. Fertile stamens 12, the filaments of the outer two rows 3 to 5 mm long, eglandular, those of inner two rows prominently biglandular at the base. Rudimentary ovary narrowly ovoid, glabrous.

LUZON, Abra Province, Mount Posuey, *Bur. Sci.* 27048 Ramos, February 4, 1917, on damp forested slopes.

This belongs in the small group of species with the umbels arranged in somewhat elongated axillary racemes, such as *Litsea anomala* Merr., *L. leytenensis* Merr., and *L. plateaeifolia* Elm.; it is, however, very different from these three species. Its extra-Philippine allies are apparently *Litsea myristicaefolia* Hook. f. and *L. teysmanni* Gamble.

LITSEA AMPLA sp. nov.

Arbor usque ad 20 m alta subtus foliis ad costa nervisque partibus junioribusque pallide fulvo-villosis; foliis alternis, late ellipticis ad subobovatis, coriaceis, usque ad 30 cm longis, apice obtusis ad breviter abrupte acuminatis, basi late rotundatis, nervis utrinque circiter 20, subtus valde prominentibus, reticulis primariis prominentibus, subparallelis; fructibus e ramulis defoliatis, fasciculatis, pedicellis ferrugineo-pubescentibus, calycibus accrescentibus, circiter 7 mm diametro.

A tall tree, the branches terete, smooth, brownish, glabrous, the branchlets densely pale fulvous-pubescent with short hairs, the same type of indumentum on the petioles, the lower surfaces of the leaves, and the peduncles. Leaves alternate, broadly ellip-

tic to subobovate, coriaceous, 20 to 30 cm long, 11 to 17 cm wide, base broadly rounded, apex obtuse to abruptly and shortly acuminate, the upper surface somewhat olivaceous when dry, smooth and shining, glabrous, or the midrib very slightly pubescent, the lower surface a little paler than the upper, distinctly and shortly pubescent on the midrib, the lateral nerves, and the primary reticulations, the indumentum pale-fulvous, dense on the midrib and primary nerves; lateral nerves about 20 on each side of the midrib, very prominent on the lower surface, spreading-curved, the primary reticulations lax, prominent, subparallel; petioles 2.5 to 3.5 cm long, densely pubescent. Flowers on the branches below the leaves, fascicled in the axils of fallen leaves, the peduncles up to at least 10 in each fascicle, stout, about 8 mm long, densely pale fulvous-pubescent, each bearing at its apex from 1 to 3 sessile, young fruits. Calyx accrescent, in young fruit about 7 mm long, 7 mm in diameter at the apex, truncate, externally very slightly pubescent, dark brown, gradually narrowed to the base. Very young fruits oblong-obovoid, about 1 cm long, glabrous, dark brown, wrinkled, and shining when dry.

SAMAR, *Phil. Pl.* 1654 Ramos, April, 1914 (type). LUZON, Isabela Province, Ilagan, *For Bur.* 20866 Bernardo, Oct. 2, 1913, locally known here as *baticuling*.

A species belonging in the group with *Litsea philippinensis* Merr., but very distinct from that form in its much larger leaves which are prominently pubescent beneath.

LITSEA DOLICHOPHYLLA sp. nov.

Arbor circiter 18 m alta subtus foliis ramulis petioliisque dense fulvo-villosis; foliis subverticillatis, oblongis, coriaceis, usque ad 55 cm longis, utrinque subaequaliter angustatis, basi acutis, apice acuminatis, nervis utrinque circiter 14, subtus valde prominentibus; fructibus in ramis defoliatis, fasciculatis, breviter pedicellatis, ellipsoideis ad obovoideis, circiter 1.5 diametro, ut videtur extus carnosus, in siccitate nigris, nitidis, calycibus accrescentibus, leviter pubescentibus, circiter 8 mm diametro.

A tree about 18 m high, the branches terete, brown-pubescent, the younger parts densely so. Leaves subverticillate, oblong, 35 to 55 cm long, 9 to 13 cm wide, coriaceous, subequally narrowed to the acute base and the rather sharply acuminate apex, the upper surface brownish-olivaceous, smooth, glabrous, and shining when dry, the lower surface densely and softly fulvous-villous, the indumentum on the midrib and lateral nerves denser and darker in color than on the surface; lateral nerves about

14 on each side of the midrib, very prominent, ascending, somewhat curved, joining the somewhat thickened and revolute margins, the primary reticulations lax, subparallel, distinct; petioles stout, 3.5 to 6 cm long, densely brown-villous. Flowers not seen. Fruits fascicled along the branches below the leaves, usually three or four in a fascicle, the pedicels very stout, 2 to 4 mm long, glabrous or nearly so, the accrescent calyx shallow, brown when dry, very sparingly pubescent, about 8 mm in diameter, thickly coriaceous. Fruits red when mature, ellipsoid to ob-ovoid, when fresh the pericarp apparently somewhat fleshy, when dry about 1.5 cm in diameter, nearly black, wrinkled, somewhat shining, glabrous.

SAMAR, Cauayan Valley, *Bur. Sci. 17540 Ramos*, March 27, 1914, in damp forests.

A very striking species, apparently belonging in the group with *Litsea tayabensis* Elm. Its elongated, coriaceous, large leaves, which are glabrous and shining on the upper surface and densely brown- to fulvous-villous on the lower surface, are very characteristic.

LITSEA EUPHLEBIA sp. nov.

Arbor circiter 12 m alta ramulis petiolis inflorescentisque exceptis glabra; foliis coriaceis, oblongis ad anguste oblongo-ellipticis, alternis, nitidis, utrinque angustatis, acuminatis, usque ad 18 cm longis; nervis utrinque 6 ad 9, adscendentibus, prominentibus; inflorescentiis axillaribus, ferrugineo-pubescentibus, involucris fasciculato-umbellatis, breviter pedunculatis, circiter 6-floris; fructibus ellipsoideis, circiter 2 cm longis, calycibus auctis, 1.5 ad 2 cm diametro.

A tree about 12 m high, the branchlets, petioles, and inflorescence ferruginous- or brown-pubescent, otherwise glabrous. Branches terete, reddish-brown or somewhat grayish. Leaves alternate, coriaceous, shining, oblong to narrowly elliptic-oblong, about equally narrowed at both ends, the apex acuminate, base acute, 12 to 18 cm long, 3 to 5.5 cm wide, the lower surface somewhat paler than the upper; nerves 6 to 9 on each side of the midrib, very prominent on the lower surface, curved-ascending, obscurely anastomosing, the ultimate reticulations not prominent but close, very obscurely pitted; petioles 1 to 1.5 cm long, at first pubescent, becoming glabrous. Involucres subumbellately fascicled, axillary, densely pubescent, the pubescent peduncles 2 to 3 mm long. Involucral bracts orbicular, concave, 3 to 4 mm in diameter. Flowers about 6 in each involucre, the calyx-tube somewhat urceolate, pubescent, 4 mm long, the lobes deciduous, oblong, about 1.3 mm long. Male flowers not seen. Fruit ellip-

soid, smooth, about 2 cm long, seated on the enlarged, cup-shaped calyx, which is 1.2 to 2 cm in diameter and about 1 cm high.

LUZON, Laguna Province, near San Antonio, *Bur. Sci.* 13523 Ramos, (type), August, 1910, *For Bur.* 15360 Tamesis, November, 1909.

A species well characterized by its very prominently nerved leaves, but which may, when male flowers are known, prove to belong in the genus *Lindera* rather than in *Litsea*.

LITSEA MACGREGORII sp. nov.

Arbor, inflorescentibus exceptis glabra, ramis ramulisque teretibus; foliis alternis vel subverticillatis, oblongis, coriaceis, usque ad 16 cm longis, nitidis, subtus glaucescentibus, utrinque subaequaliter angustatis, basi acutis, apice obtusis, nervis utrinque circiter 10, adscendentibus, subtus valde prominentibus; umbellis pedunculatis, axillaribus et e axillis defoliatis, fasciculatis, 4- vel 5-floris, floribus pubescentibus, pedicellatis, bracteis involucrentibus caducis.

A tree, glabrous except the inflorescence, the branches and branchlets nearly black when dry, terete, smooth. Leaves alternate or subverticillate, oblong, coriaceous, 13 to 16 cm long, 3 to 4.5 cm wide, subequally narrowed to the acute base and to the obtuse apex, the upper surface smooth and shining, brownish-olivaceous, the lower paler and more or less glaucous; lateral nerves about 10 on each side of the midrib, ascending, very prominent on the lower surface, nearly straight, the reticulations obscure; petioles 1.5 to 2 cm long, dark reddish-brown when dry. Umbels axillary and from the axils of fallen leaves, 4 to 6 in a fascicle, the peduncles 1.5 to 2 cm long, all parts rather densely pale-pubescent. Involucral bracts caducous. Flowers 4 or 5 in each umbel, the pedicels about 4 mm long, rather slender, pubescent. Perianth lobes about 4 mm long, elliptic, obtuse, concave, rather densely pale-pubescent. Fertile stamens 9, the anthers oblong, 2 mm long, the filaments somewhat pubescent, about 1 mm long, the glands about 0.6 mm in diameter.

BILIRAN, *Bur. Sci.* 18493 McGregor, May 22, 1914, in forests, altitude about 200 meters.

The specimens present male flowers only, and the species resembles *Litsea euphlebia* Merr. in vegetative characters, but differs from it and from *L. quercoides* Elm. in its comparatively long-peduncled umbels.

LITSEA MICRANTHA sp. nov.

Arbor, partibus junioribus subtus foliis inflorescentibusque minute pubescentibus exceptis glabra; foliis alternis, oblongis, chartaceis vel subcoriaceis, usque ad 8 cm longis, utrinque

subaequaliter angustatis, basi acutis, apice acutis vel breviter acuminatis, nervis utrinque circiter 10; umbellulis axillaribus, parvis, tenuiter pedicellatis, fasciculatis vel in racemis brevissimis dispositis, circiter 4-floris, floribus 3 mm longis, filamentis ciliatis.

A tree, nearly glabrous, the branches and branchlets very slender, terete, smooth, grayish-brown, the ultimate ones about 1 mm in diameter and minutely appressed pubescent with short hairs. Leaves alternate, in general oblong, chartaceous to subcoriaceous, brown or brownish-olivaceous when dry, glabrous, the lower surface slightly paler than the upper and very minutely pubescent, 5 to 8 cm long, 1.5 to 2.5 cm wide, subequally narrowed to the acute base and to the acute or slightly acuminate apex; lateral nerves about 10 on each side of the midrib, slender, distinct on the lower surface, curved, the reticulations not prominent; petioles slender, 4 to 5 mm long. Umbels mostly 4-flowered, axillary, fascicled or in very short racemes, the pedicels slender, slightly pubescent, 4 to 5 mm long, the umbels, before anthesis, somewhat depressed-globose, 2 to 2.5 mm in diameter. Bracts 4, very slightly pubescent externally, broadly ovate, concave, rounded, 2 to 2.5 mm long. Male flowers about 3 mm long, the segments 6, oblong, 1.3 to 1.5 mm long, the tube appressed fulvous-pubescent including also the 1 mm long pedicels. Fertile stamens 9, all 4-celled, introrse, the outer ones 2.5 to 3 mm long, their filaments slender, ciliate.

SAMAR, *Bur. Sci.* 17505 Ramos, April 3, 1914, in forests at low altitudes.

A species belonging in the group with *Litsea luzonica* F.-Vill., well characterized by its comparatively small flowers and umbels.

LITSEA OBLONGIFOLIA sp. nov.

Arbor circiter 8 m alta, inflorescentiis exceptis glabra; foliis oblongis vel anguste oblongis, alternis, coriaceis, utrinque subaequaliter angustatis, acutis vel leviter acuminatis, nitidis, nervis utrinque 8 ad 11, curvato-adscententibus, prominentibus, reticulis tenuibus, densis; inflorescentiis subumbellato-fasciculatis, dense brunneo-pilosis, involucris in alabastro globosis, circiter 5-floris; antheris 12, introrsis.

A tree about 8 m high, glabrous except the inflorescence. Branches terete, dark when dry. Leaves alternate, oblong to narrowly oblong, 18 to 30 cm long, 4 to 7 cm wide, subequally narrowed and acute or slightly acuminate at both ends, coriaceous, shining when dry, the lower surface paler than the upper one; nerves 8 to 11 on each side of the midrib, curved-ascending, prominent, obscurely anastomosing, the ultimate reticulations

slender, dense; petioles 1.5 to 2 cm long. Involucres in axillary, solitary, subumbellate fascicles, the peduncles and bracts densely brown-pilose, the peduncles 5 to 10 mm long. Involucral bracts usually 4, in nearly mature bud about 4 mm in diameter, concave, orbicular. Flowers about 5 in each head, pubescent. Fertile anthers 12, all introrse.

LUZON, Cagayan Province, Abulug River, *Bur. Sci. 14518 Ramos*, February, 1912, in forests.

A fruiting specimen from the same locality, *Bur. Sci. 18902 Ramos*, presumably represents the same species, but has relatively somewhat broader leaves, and its lateral nerves are more spreading. The accrescent calyx is funnel-shaped, about 1.5 cm long, 1 cm wide, and the fruit is subglobose or depressed-globose, apparently somewhat fleshy, black when dry, 2 cm in diameter.

Apparently closely allied to *Litsea albayana* Vid., but differing especially in its fine, close ultimate reticulations, which in Vidal's species are very obscure or nearly obsolete.

LITSEA SAMARENSIS sp. nov.

Arbor circiter 12 m alta, ramulis junioribus et subtus foliis minute pubescentibus; foliis alternis, oblango-obovatis, subcoriaceis, usque ad 35 cm longis, apice late rotundatis vel abrupte brevissime acuminatis, basi acutis, nervis utrinque circiter 18, subtus prominentibus; fructibus e ramis defoliatis, solitariis vel fasciculatis, ovoideis, 2 to 3 cm longis, calycibus accrescentibus infundibuliformibus, circiter 1.5 cm longis 1 cm diametro.

A tree about 12 m high, the younger branchlets, petioles, and lower surfaces of the leaves minutely pubescent with short, rather pale hairs. Branches terete, glabrous, smooth, about 1 cm in diameter, the branchlets much more slender, slightly pubescent. Leaves alternate, sometimes somewhat crowded toward the apices of the branchlets, oblong-obovate, subcoriaceous, 22 to 35 cm long, 12 to 18 cm wide, the apex broadly rounded to abruptly and shortly acuminate, base acute, the upper surface olivaceous, shining, the lower somewhat paler, minutely cinerous-pubescent on the midribs, nerves, and reticulations; lateral nerves about 18 on each side of the midrib, prominent, spreading-curved, the primary reticulations subparallel, prominent on the lower surface, the ultimate reticulations shallowly foveolate on both surfaces; petioles rather slender, 4 to 6 cm long, nearly black when dry, sparingly cinereous-pubescent. Fruits on the branches below the leaves, solitary or somewhat fascicled, the peduncles stout, brown, glabrous, about 1 cm long, the accrescent calyx funnel-shaped, about 1.5 cm long and 1 cm in diameter at the apex, truncate,

narrowed below, thick, brown, much wrinkled when dry. Fruit ovoid, 2 to 3 cm long, apparently dark-red and somewhat fleshy when fresh, when dry black, shining, wrinkled, glabrous, obtuse or rounded at the apex.

SAMAR, Cauayan Valley, *Bur. Sci. 17541 Ramos*, March 24, 1914, on forested slopes.

Very distinct from *Litsea ampla* Merr. which it somewhat resembles; among the distinguishing characters are its differently shaped leaves, which are acute at the base, much longer petioles, and much larger fruits and calyces.

LITSEA VANOVERBERGHII sp. nov.

Arbor 5 ad 6 m alta ramulis junioribus et inflorescentiis exceptis glabra; foliis alternis, oblongis ad oblongo-ellipticis, coriaceis, usque ad 9 cm longis, utrinque subaequaliter angustatis, basi acutis, apice obtusis at leviter acuminatis, nervis utrinque 8 vel 9, reticulis obscuris; umbellis axillaribus, fasciculatis, circiter 6-floris, pedicellatis, floribus dense pubescentibus, 4 ad 5 mm longis; fructibus anguste ovoideis, acutis, circiter 2.5 cm longis, calycibus accrescentibus, hypocrateriformibus, 1 cm diametro.

A tree, apparently dioecious, 5 to 6 m high, glabrous except the inflorescence and the very youngest branchlets. Branches grayish-brown or brownish, terete, 3 to 4 mm in diameter, the young branchlets minutely cinereous-puberulent. Leaves alternate, oblong to oblong-elliptic, thickly coriaceous, 6 to 9 cm long, 2.5 to 4 cm wide, subequally narrowed to the acute base and to the obtuse, acute, or obscurely acuminate apex, brownish or brownish-olivaceous on the upper surface, somewhat shining, the lower surface paler; lateral nerves 8 or 9 on each side of the midrib, prominent, curved, not or very obscurely anastomosing, brown when dry, the reticulations obscure, both surfaces minutely and very shallowly foveolate, the upper more distinctly so than the lower; petioles glabrous, brown, about 8 mm long. Umbels axillary, fascicled, 3 to 6 in a fascicle, the peduncles appressed-pubescent, 4 to 5 mm long. Bracts 4, ovate to broadly ovate, concave, rounded, slightly pubescent externally, about 4 mm long. Flowers usually 6 in each umbel, 4 to 5 mm long, the tube somewhat urceolate, appressed-pubescent, somewhat narrowed below, the lobes 6, subequal, obtuse to acute, ovate to oblong-ovate, 1.5 mm long or less. Staminodes 6, in two series, the inner three about 1.2 mm long, linear-lanceolate, 0.2 mm wide, with two prominent, lateral, stipitate, capitate glands at the base, the outer three staminodes linear-lanceolate to linear-oblancheolate, without appendages, the lower part pro-

minently ciliate. Ovary ovoid, glabrous; style about 2 mm long. Fruit narrowly ovoid, about 2.5 cm long, apex acute, the accrescent calyx salver-shapped, the tube subcylindric, stout, about 5 mm long, the limb spreading, about 1 cm in diameter.

LUZON, Bontoc Subprovince, Bauco, *Vanoverbergh* 1787, November 8, 1912, in forests, altitude about 1,700 meters.

I have some doubt as to the genus of this species, although it is probably a *Litsea*. The species is apparently dioecious, as a careful examination of very many flowers failed to show a single one with fertile stamens.

LITSEA ALBAYANA Vid. Rev. Pl. Vasc. Filip. (1886) 227.

LUZON, Albay Province, Vidal 860 (type), 1681, in Herb. Kew. LEYTE, *For. Bur.* 12784 *Rosenbluth*. I am disposed also to refer here *Cuming* 894 from Albay Province, Luzon, on which is based the Philippine reference of *Lindera reticulata* F.-Vill., and *For. Bur.* 7317 *Everett*, *For. Bur.* 15148 *Tarrosa*, from Negros.

The species is an imperfectly known one and may just as well be referable to *Lindera* as to *Litsea*, for the flowers are as yet unknown. Meissner² referred *Cuming* 894 to *Aperula reticulata* Blume (*Lindera reticulata* F.-Vill.). I have examined the type of Blume's species in the Leiden Herbarium, and it is a plant entirely different from that represented by *Cuming* 894; the reference of *Cuming*'s plant to Blume's species was a manifest error on the part of Meissner.

PHOEBE Nees

PHOEBE GLABRIFOLIA sp. nov.

Arbor usque ad 18 m alta, partibus junioribus inflorescentiisque exceptis glabra; foliis oblongo-obovatis, coriaceis, usque ad 22 cm longis, apice obtusis ad latissime breviter et obtuse acuminatis, deorsum angustatis, basi acutis, nervis utrinque circiter 8, subtus valde prominentibus; paniculis axillaribus, longe pedunculatis, usque ad 18 cm longis, floribus circiter 6 mm diametro.

A tree 15 to 18 m high, glabrous or nearly so except the younger parts and the inflorescence. Branches terete, brownish, rather stout, often with numerous rather large petiolar scars, glabrous, the younger parts sparingly pubescent. Leaves somewhat crowded at the apices of the branchlets, oblong-obovate, rather thickly coriaceous, 12 to 22 cm long, 5 to 8 cm wide, the upper surface brownish-olivaceous when dry, glabrous, shining, the lower slightly paler, rarely somewhat glaucous, glabrous or very minutely and obscurely puberulent, the apex obtuse to very broadly, shortly, and bluntly acuminate, narrowed below to the acute base; lateral nerves about 8 on each side of the midrib, very prominent on the lower surface, looped-anastomosing, the reticulations prominent; petioles 1.5 to 2 cm long. Panicles axillary,

² DC. Prodr. 15¹ (1864) 243.

long-peduncled, up to 18 cm long, the peduncles very slightly pubescent, the flower bearing parts rather prominently grayish-pubescent, flowers about 6 mm in diameter, the bracteoles oblong, acute to acuminate, about 2.5 mm long, pubescent. Perianth-lobes broadly ovate, 3.5 to 4 mm long, obtuse, pubescent. Other two rows of stamens with introrse anthers, about 2.5 mm long, the filaments slightly pubescent, the third row of stamens about 2 mm long, extrorse, each filament with a pair of stipitate, subcapitate glands near the base. Staminodes (fourth row) heart-shaped, about 1 mm long, on stout short stipes. Ovary globose, glabrous; style about 1.5 mm long. Fruit narrowly ovoid, about 1.5 cm long (immature), smooth, black and shining when dry, the perianth-lobes somewhat accrescent and 6 to 7 mm long, brown, short-pubescent, persistent.

BASILAN, *For. Bur.* 18894 *Miranda*, August, 1912 (type), *Bur. Sci.* 16159, 16158 *Reillo*, August, 1912, in forests along Comalarang River.

This species is manifestly very closely allied to *Phoebe cuneata* Blume, but appears to differ from it in its leaves being quite glabrous on both surfaces or at most very obscurely puberulent on the lower surface.

NEW PHILIPPINE MYRSINACEAE

By E. D. MERRILL¹

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

In the present paper eighteen apparently new species of Philippine *Myrsinaceae* are described in the genera *Ardisia*, *Discocalyx*, and *Maesa*. Perhaps the most interesting fact brought out by the present contribution is the great increase in the number of known species of the genus *Discocalyx*. When Mez proposed this genus in 1902, he described eight species, of which six were from the Philippines, one from the Marianne Islands, and one from the Tonga Islands. Since that date numerous new forms have been detected in our current Philippine collections, and the number of species now known from the Philippines, including the nine described in the present paper, approximates twenty-seven.

DISCOCALYX Mez

DISCOCALYX ANGUSTISSIMA sp. nov.

Frutex glaber, circiter 1 m altus; foliis numerosis, linearis, usque ad 25 cm longis et 1 cm latis, olivaceis, nitidis, tenuiter acuminatis, basi attenuatis, margine distanter acute serratis; inflorescentiis axillaribus, tenuibus, longissime pedunculatis, foliis subaequantibus; floribus paucis, 5-meris; fructibus ovoideis, circiter 6 mm diametro.

A glabrous shrub about 1 m high, simple or sparingly branched, the branches terete, reddish-brown, 3 to 6 mm in diameter. Leaves numerous, linear, 20 to 25 cm long, 6 to 10 mm wide, chartaceous, olivaceous, shining, slenderly acuminate, base attenuate, margins rather distantly but conspicuously and acutely serrate; lateral nerves numerous, not prominent. Inflorescences few, very slender, axillary, about as long as the leaves, simple, the greatly elongated peduncles supplied with few, scattered, linear-lanceolate, slenderly acuminate, leaf-like, 1 to 2 cm long

¹ Professor of botany, University of the Philippines.

bracts, the apical 1 cm usually thickened, brown, marked with numerous scars of fallen bracts or bracteoles and pedicels, in fruit each bearing 1 to 2, slender, jointed pedicels 3 to 4 cm in length. Fruits ovoid, about 6 mm in diameter, with distinct but shallow longitudinal grooves, the persistent sepals 5, ovate-lanceolate, acuminate, about 1 mm long.

ALABAT, *Merrill 10478* (type), December 24, 1916, on forested ridges, altitude about 75 meters. LUZON, Tayabas Province, Mauban, *Bur. Sci. 19480 Ramos*, January 25, 1913, on forested slopes: Laguna Province, Mount Bucol back of Santa Maria Maviñac, *For. Bur. 8897 Curran* (sterile), February, 1908.

A most characteristic species not at all closely allied to any other known form, readily recognizable by its greatly elongated, very narrow, distantly but conspicuously serrate leaves. It is apparently very local. On Alabat Island but a few individuals were observed, and these all confined to a small area.

DISCOCALYX EUPHLEBIA sp. nov.

Frutex 3 ad 4 m altus, glaber, ramulis circiter 1 cm diametro; foliis ellipticis ad oblongo-ellipticis, in siccitate brunneis, nitidis, usque ad 40 cm longis, breviter acuminatis, basi plus minusve acuminatis, margine distincte dentatis vel crenato-dentatis, nervis utrinque circiter 20, supra impressis, subtus valde prominentibus, utrinque maculis nigris conspicuis instructis; paniculis ♂ usque ad 15 cm longis, e ramulis specialibus circiter 10 cm longis extra-axillaribus supra valde incrassatis cicatricibus multis instructis; floribus 5-meris, prominente glandulosis, circiter 2.5 mm diametro.

A glabrous dioecious shrub 3 to 4 m high, the ultimate branches terete, about 1 cm thick, with few, very large scars of fallen petioles. Leaves brown and shining when dry, elliptic to oblong-elliptic, 35 to 40 cm long, 10 to 13 wide, both surfaces with conspicuous, nearly black, gland-like areas, usually one in each ultimate reticulation, subcoriaceous, the apex shortly acuminate, base somewhat acuminate, the margins, except in the lower part, with distinct dentate or dentate-crenate teeth; lateral nerves about 20 on each side of the midrib, impressed on the upper surface, very prominent beneath, the reticulations distinct; petioles 4 to 5 cm long. Staminate panicles up to 15 cm long, usually 6 to 8 at the apex of the specialized branch bearing them, these specialized branches up to 10 cm long, the upper 2.5 to 4 cm cylindric, thicker than the peduncular portions, 5 to 7 mm in diameter, and marked with numerous scars of fallen bracts and peduncles, the specialized branches extra-axillary; rachis and branches of the panicles slender. Flowers very shortly pedicel-

led, 5-merous, about 2.5 mm in diameter. Sepals nearly free, oblong-obovate or oblong, about 1.2 mm long, with few, conspicuous, dark-brown glands. Petals oblong, obtuse, 1.5 mm long, prominently glandular, nearly free. Anthers sessile, 0.5 mm long.

SAMAR, Paranas, *Bur. Sci.* 17646 Ramos, April 11, 1914, in damp forests at low altitudes.

The alliance of this species is manifestly with *Discocalyx insignis* Merr. from which it is distinguished by its conspicuously maculate leaves and its much longer staminate panicles. Other species belonging in the same group are *Discocalyx congestiflora* Elm., *D. longifolia* Merr., *D. montana* Elm., and *D. macrophylla* Merr. *Discocalyx maculata* Merr., among other characters, is at once distinguished by its entire leaves.

DISCOCALYX LUZONIENSIS sp. nov.

Frutex glaber, ramis ramulisque teretibus, ramulis circiter 5 mm diametro; foliis sparsis, coriaceis, nitidis, oblongis ad oblongo-ellipticis, integris, acutis, usque ad 9 cm longis, obscure maculatis, nervis primariis utrinque circiter 8, irregularibus, subtus distinctis, anastomosantibus; ramis specialibus extra-axillaribus, usque ad 12 cm longis, partibus superioribus incrassatis, cicatricibus distinctis instructis; paniculis depauperatis, circiter 1 cm longis; floribus ♂ 5-meris, pedicellis et sepalis et petalis prominente glandulosis.

A glabrous dioecious shrub, the branches and branchlets rather stout, terete, grayish-brown when dry, with few, widely scattered, large scars of fallen petioles, the ultimate branchlets about 5 mm in diameter. Leaves scattered, coriaceous, entire, rather pale when dry, shining, oblong to oblong-elliptic, 8 to 9 cm long, 3 to 4 cm wide, acute, base acute or acuminate, both surfaces obscurely maculate; primary lateral nerves about 8 on each side of the midrib, distinct on the lower surface, somewhat curved, irregular, distinctly anastomosing, the secondary veins nearly as prominent as the primary ones, the reticulations evident on both surfaces; petioles rather stout, 3 to 4 cm long. Specialized branches bearing the inflorescences extra-axillary, 8 to 12 cm long, the apical 1 to 2 cm thickened, cylindric, about 3 mm in diameter, marked with distinct scars of fallen bracts, the peduncle often dichotomous and bearing two thickened cylindric, parts at the apex. Inflorescences at the tips of the specialized branches, depauperate, about 1 cm long, few-flowered. Staminate flowers 5-merous; the pedicels, calyces, and corollas prominently glandular. Pedicels 1 to 2 mm long. Calyx 2.2 mm in diameter, the teeth 5, ovate, obtuse, 0.7 mm long. Corolla 1.8 mm long, the lobes ovate or oblong-ovate, rounded, 0.9 mm long.

Anthers sessile, 0.4 mm long. Rudimentary ovary stout, cylindrical, about 1 mm long.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26474 Ramos & Edaña, August 16, 1916, on forested slopes, altitude between 300 and 400 meters.

The alliance of this species is apparently with *Discocalyx maculata* Merr., from which it is readily distinguished by its much smaller, fewer-nerved, obscurely maculate leaves. The specialized branches bearing the inflorescences are frequently dichotomous, bearing two cylindric, thickened branches at their apices.

DISCOCALYX MICRANTHA sp. nov.

Frutex erectus, glaber, circiter 2 m altus; foliis chartaceis, oblongis, longe petiolatis, usque ad 18 cm longis, olivaceis, apice breviter acuminatis, basi decurrento-acuminatis, integris, nervis utrinque circiter 20, tenuibus, subadscendentibus; paniculis axillaribus, tenuibus, solitariis, circiter 10 cm longis, longe pedunculatis; floribus minutis, pedicellatis, 5-meris, calycibus petalisque distincte glanduloso-punctulatis, petalis obovatis, circiter 1.2 mm longis.

An erect glabrous shrub about 2 m high, apparently dioecious, the branches subolivaceous, about 5 mm in diameter, longitudinally wrinkled when dry, the tips brown. Leaves somewhat crowded toward the apices of the branchlets, chartaceous, oblong, 14 to 18 cm long, 3.5 to 5 cm wide, subolivaceous when dry, slightly shining, of the same color on both surfaces, entire, the apex shortly acuminate, base slenderly decurrent-acuminate; lateral nerves slender, the primary ones about 20 on each side of the midrib, subascending, slightly curved, the reticulations not prominent; petioles 1.5 to 3 cm long. Panicles bipinnate, axillary, solitary, up to 10 cm long, long peduncled, the branches few, the longer primary ones 1.5 to 2.5 cm in length. Staminate flowers 5-merous, their pedicels about 1 mm long. Calyx about 1.5 mm in diameter, obscurely 5-toothed, distinctly glandular-punctulate, the teeth short, obtuse, minutely denticulate or subcrenate. Petals obovate, 1.2 mm long, glandular-punctulate. Anthers 0.7 mm long.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27132 Ramos, March 12, 1917, in forests along streams at low altitudes.

The alliance of this species is manifestly with *Discocalyx cybianthoides* Mez, which it resembles in its general appearance, in leaf characters, and in its panicles springing from the axils of normal leaves, differing essentially in its very much smaller flowers.

DISCOCALYX PACHYPHYLLA sp. nov.

Frutex dioicus, glaber, circiter 5 m altus; foliis numerosis,

plus minusve confertis, coriaceis, oblongo-oblancoelatis vel anguste oblongo-ovatis, integris, usque ad 18 cm longis, in siccitate brunneis, nitidis, acutis vel leviter acuminatis, basi acutis; inflorescentiis e ramis specialibus, paniculis δ confertis, junioribus circiter 4 cm longis bracteis glandulosis membranaceis usque ad 2 cm longis ovato-ellipticis deciduis involucreis; floribus parvis, 4- vel 5-meris, glandulosis.

A dioecious glabrous shrub about 5 m high, the branches and branchlets terete, brown, the latter usually about 5 mm in diameter, usually with numerous close scars marking the limits of the past seasons growth, the leaves numerous, rather crowded. Leaves rather thickly coriaceous, entire, pale-brownish, shining and of the same color on both surfaces when dry, not glandular but beneath very obscurely punctulate, oblong-oblancoelate to narrowly oblong-obovate, apex acute or somewhat acuminate, narrowed from the upper one-half to two-thirds to the cuneate base; primary lateral nerves about 8 on each side of the midrib, irregular, ascending, scarcely more prominent than are the secondary nerves and reticulations; petioles stout, 4 to 5 cm long. Staminate panicles on specialized extra-axillary branches, these branches 4 to 8 cm long, rather stout, the upper 0.5 to 2 cm thickened, cylindric, marked with numerous scars of fallen bracts, the bracts subtending and enclosing the young panicles brown when dry, membranaceous, prominently glandular, ovate-elliptic, obtuse or rounded, deciduous. Panicles crowded at the apices of the specialized branches, up to 4 cm long, probably longer when mature. Flowers numerous, small, in bud globose, 4- or 5-merous, both calyx and corolla prominently glandular.

LUZON, Tayabas Province, Mount Cadig, *Bur. Sci.* 20729, 20766, 20830 *Escritor*, March, 1913, the last two numbers erroneously localized on the herbarium labels as Guinayangan.

A species well characterized by its numerous, thickly coriaceous, entire, shining leaves; and its rather dense panicles, which are crowded at the apices of the specialized branches and subtended by large, membranaceous, glandular bracts, these forming an involucre at the apex of the branch below the panicles. On two of the specimens cited above there are one or two greatly reduced, 3 to 5 cm long, coriaceous leaves on the specialized branches, as is the case with a few other species of the genus.

DISCOCALYX SAMARENSIS sp. nov.

Frutex dioicus, glaber, circiter 5 m altus; foliis numerosis, pseudoveriticillatis, oblancoelatis, integris, usque ad 14 cm longis, in siccitate pallidis, subcoriaceis, margine leviter revolutis, acutis vel obscure acuminatis, deorsum sensim angustatis, nervis utrinque circiter 12, tenuibus, adscendentibus; paniculis δ axillaribus,

bipinnatis, foliis subaequantibus; floribus 5-meris, circiter 4 mm longis.

A dioecious glabrous shrub about 5 m high, the branches brownish, smooth, 4 to 5 mm in diameter. Leaves pseudo-verticillate, oblanceolate, 11 to 14 cm long, 1.6 to 2 cm wide, entire, margins slightly revolute, acute or obscurely acuminate, gradually narrowed below to the stout petiole, pale and shining when dry, of about the same color on both surfaces; primary nerves about 12 on each side of the midrib, slender, ascending; petioles 5 mm long or less. Staminate panicles axillary, bipinnate, about as long as the leaves, the peduncles and lower branches 3 to 4 cm in length. Flowers white, 5-merous, their pedicels about 4 mm long. Calyx subrotate, about 3 mm in diameter, usually eglandular, the teeth triangular-ovate, obtuse or subacute, less than 1 mm long. Corolla 4 mm long, the lobes oblong, obtuse, about 2.5 mm long, with a few conspicuous glands above, united for the lower 1.5 mm. Stamens 5, the anthers oblong, sessile, obtuse, the connectives eglandular. Rudimentary ovary thickened upward, truncate, 1.7 mm long.

SAMAR, San José de Buan, along streams, altitude about 300 meters, *For. Bur.* 24004 *Lasquety*, May 7, 1915.

A species manifestly allied to *Discocalyx cybianthoides* Mez, from which it is distinguished by its much smaller, narrower leaves and much larger flowers.

DISCOCALYX STENOPHYLLA sp. nov.

Frutex glaber, circiter 4.5 m altus, dioicus; foliis oblongo-lanceolatis ad oblongo-lanceolatis, subcoriaceis, pallidis, nitidis, integris, usque ad 15 cm longis, obtusis vel obscure acuminatis, basi angustatis, nervis utrinque circiter 15, tenuibus, utrinque reticulatis; paniculis ♂ subterminalibus, usque ad 12 cm longis, bipinnatis; floribus 3- vel 4-meris, eglandulosis, circiter 2 mm longis.

A glabrous dioecious shrub about 4.5 m high. Branches terete, grayish or brownish, smooth, 2 to 3 mm in diameter. Leaves scattered or pseudo-verticillate, subcoriaceous, pale, shining, of the same color on both surfaces when dry, oblong-lanceolate to somewhat oblanceolate, entire, obtuse to obscurely acuminate, base gradually narrowed, cuneate; primary lateral nerves about 15 on each side, slender, irregular, not prominent, curved, anastomosing, the primary and secondary nerves and the reticulations evident on both surfaces; petioles stout, 4 to 6 mm long. Staminate panicles several in the uppermost axils, that is, subterminal, up to 12 cm long, bipinnate, slender, the primary branches scattered, spreading, the lower ones up to 3 cm long. Flowers

3- and 4-merous, eglandular, their pedicels 2.5 mm long. Calyx somewhat cup-shaped, about 1.7 mm in diameter, the teeth short, rounded. Corolla 2 mm long, the lobes 3 or 4, elliptic, rounded, about 1.2 mm long. Anthers oblong, 1 mm long, obtuse, the connectives glandular. Rudimentary ovary none.

LUZON, Pangasinan Province, Mangatarem, *For. Bur.* 24815 Pascual, November 23, 1915, among undergrowth in forests, altitude about 300 meters, locally known as *rococoso*.

The alliance of this species is manifestly with *Discocalyx cybianthoides* Mez, from which it is readily distinguished by its much smaller, narrower leaves and eglandular flowers. From *D. samaransis* Merr. it is distinguished by its much smaller flowers. In general appearance it somewhat resembles *Discocalyx angustifolia* Mez, but the primary and secondary nerves and the reticulations are evident on both surfaces of the leaves.

DISCOCALYX SESSILIFOLIA sp. nov.

Arbor parva, glabra, omnibus partibus in siccitate brunneis, ramis ramulisque crassis, laevis, 5 ad 7 mm diametro; foliis subcoriaceis, anguste, oblongo-obovatis ad oblanceolatis, nitidis, usque ad 20 cm longis, obtusis vel obscurissime late et obtuse acuminatis, basi sensim angustatis, sessilibus, subtus obscurissime puncticulatis, nervis numerosis, vix prominentibus; paniculis ♂ bipinnatis, usque ad 10 cm longis, in ramis specialibus axillaribus 2 ad 3 cm longis dispositis; floribus 4-meris, circiter 4 mm longis, petalis sepalisque glandulosis.

A small tree, 8 m high according to the collector, glabrous, apparently dioecious, all parts brownish when dry, the branches and branchlets stout, smooth, terete, 5 to 7 mm in diameter. Leaves scattered, narrowly oblong-obovate to oblanceolate, entire, shining, of about the same color on both surfaces, 12 to 20 cm long, 3.5 to 6 cm wide, subcoriaceous, the lower surface obscurely puncticulate, the apex obtuse to broadly and obscurely blunt-acuminate, gradually narrowed in the lower one-half to two-thirds to the cuneate base, sessile; lateral nerves slender, not prominent, 15 to 20 on each side of the midrib, scarcely more prominent than the secondary nerves and reticulations. Special branches bearing the inflorescences in the axils of fallen leaves, 2 to 3 cm long, the upper part marked with prominent scars of fallen bracts and inflorescences, about 4 mm in diameter, somewhat thicker than the peduncular portions, the bracts deciduous, lanceolate to ovate-lanceolate, membranaceous, acuminate, about 1 cm long. Staminate panicles bipinnate, up to 10 cm long, the branches spreading, the lower ones up to 2.5 cm in length, usually about four panicles from the apex of each special branch. Staminate flowers 4-merous, about 4 mm long, their pedicels about

2 mm long. Calyx somewhat cup-shaped, nearly 2 mm in diameter, with four, short, rounded, obscure teeth, their margins somewhat crenulate, glandular. Corolla 4 mm long, glandular, the lobes oblong, obtuse, 2 mm long. Stamens 4, oblong, sessile, 1.2 mm long, the connectives black-glandular on the back. Rudimentary ovary and style rather stout, about 2 mm long.

MINDANAO, Agusan Subprovince, near Butuan, *For. Bur.* 20735 Rafael & Ponce, September 12, 1913, in swamp-forests at low altitudes.

A species manifestly allied to *Discocalyx merrillii* Mez and to *D. palawanensis* Elm., well characterized, however, by its sessile leaves and much larger flowers. The specialized branches bearing the inflorescences present no reduced leaves.

DISCOCALYX TECSONII sp. nov.

Arbor glabra, 5 ad 8 m alta; foliis breviter petiolatis, oblongo-oblancheolatis, usque ad 34 cm longis, chartaceis, acutis ad leviter acuminatis, integris, deorsum sensim angustatis, basi cuneatis, nervis utrinque circiter 20, distinctis; paniculis bipinnatis, usque ad cm longis, in ramis extra-axillaribus vel e exillis defoliatis dispositis, ramis specialibus compressis, 1 ad 3.5 cm longis supra plus minusve incrassatis cicatricibus et cum foliis depauperatis instructis; floribus ♂ 4- vel 5-meris, glandulosis, circiter 3 mm longis, petalis ad basi leviter connatis.

A glabrous tree 5 to 8 m high, apparently dioecious, the branches brown when dry, terete, about 5 mm in diameter. Leaves rather pale when dry, chartaceous, oblong-oblancheolate, entire, 20 to 34 cm long, 5 to 9 cm wide, apex acute to obscurely acuminate, gradually narrowed from about the upper two-thirds to the cuneate base; lateral nerves distinct, usually about 20 on each side of the midrib, irregular, anastomosing; petioles stout, about 5 mm long. Special branches bearing the inflorescences extra-axillary or from the axils of fallen leaves, usually compressed, 1 to 3.5 cm long, about 3 mm in diameter, their apices somewhat thickened and with the evident scars of fallen peduncles, bracts, and leaves, the panicles subtended by two or three greatly reduced leaves similar to the ordinary ones but from 4 to 9 cm long, the brown bracts membranaceous, lanceolate, acuminate, about 1 cm long, deciduous. Panicles up to 6 cm long, the branches 2 cm long or less. Flowers 4- or 5-merous, the staminate ones about 3 mm long. Calyx somewhat cup-shaped, nearly 2 mm in diameter, the teeth broad, rounded, entire, glandular. Corolla 3 mm long, the lobes oblong, obtuse, free nearly to the base, glandular. Anthers sessile, oblong, 1 mm long, the connectives glandular. Rudimentary ovary and

style about 1.5 mm long, cylindric, thickened upward. Young fruits globose, about 4 mm in diameter.

BASILAN, Tumakis, *For. Bur.* 24683 Tecson (type), November 4, 1915; Mount Singal, *For. Bur.* 18977 Miranda, October 1, 1912, both in forests, altitude 20 to 100 meters, said by Tecson to be common. MINDANAO, Misamis Province, Mount Malindang, *For. Bur.* 17984 Miranda, in forests, altitude 10 meters.

This species is manifestly allied to *Discocalyx merrillii* Mez and to *D. sessilifolia* Merr., differing from both in the reduced leaves on the special branches bearing the inflorescences, these branches being much shorter than in *D. merrillii*, and in its staminate flowers being smaller than in *D. sessilifolia* Merr.

ARDISIA Swartz

ARDISIA SAMARENSIS sp. nov. § *Akosmos*.

Frutex, inflorescentiis parcissime furfuraceo-sublepidotis exceptis glaber; foliis alternis, lanceolatis ad oblongo-lanceolatis, utrinque subaequaliter angustatis, integris, basi acutis, apice distincte acuminatis, nervis lateralibus utrinque circiter 15, curvatis, anastomosantibus; paniculis axillaribus, circiter 8 cm longis, bracteis foliaceis circiter 5 mm longis, deciduis; floribus 5-meris, circiter 4 mm longis, sepalis petalisque parcissime glanduloso-puncticulatis.

A shrub about 2 m high, glabrous except the very sparingly furfuraceous-sublepidote inflorescences. Branches brownish, subterete, the branchlets more or less angled when dry. Leaves alternate, lanceolate to oblong-lanceolate, 17 to 20 cm long, 3 to 4.5 cm wide, subequally narrowed to the acute base and the rather prominently acuminate apex, entire, shining, greenish-olivaceous when dry, the glands blackish, scattered, evident on both surfaces, often to be found chiefly near the margins; lateral nerves about 15 on each side of the midrib, lax, curved, anastomosing, rather prominent on the lower surfaces, the reticulations distinct on both surfaces; petioles 1.5 to 2 cm long. Panicles axillary, peduncled, about 8 cm long, bipinnate, the primary branches few, spreading, up to 4 cm long, the greatly reduced leaf-like bracts about 5 mm long, deciduous. Flowers 5-merous, racemosely arranged on the ultimate branches, their pedicels 2 to 3 mm long. Sepals elliptic-ovate, obtuse, about 2 mm long, spreading, sparingly glandular-punctate, margins minutely ciliate. Petals elliptic-ovate, obtuse, about 4 mm long, slightly glandular-punctate. Anthers lanceolate, somewhat acuminate, 2.3 mm long, the connectives glandular.

SAMAR, Pinipisakan, *Bur. Sci.* 24462 Ramos, March 21, 1916, on steep forested slopes at low altitudes.

This species is manifestly allied to *Ardisia fragrans* Elm. and to *A. loheri* Merr., but is distinguished from both by numerous characters, the most evident one, perhaps, being the greatly reduced leaf-like bracts.

ARDISIA LOHERI sp. nov. § *Akosmos*.

Arbor parva, circiter 5 m alta, ramulis inflorescentiisque parvissime brunneo-furfuraceo-tomentellis exceptis glabra; foliis oblongis ad oblongo-ellipticis, usque ad 22 cm longis, utrinque subaequaliter angustatis, acuminatis, basi acutis, in siccitate pallide olivaceis, nervis utrinque 20 ad 25, subtus prominentibus, utrinque, saltem prope margine, punctis permanifestis instructis; inflorescentiis axillaribus, bipinnatim paniculatis, pedunculatis, usque ad 18 cm longis, multifloris; floribus racemose dispositis, 5-meris, circiter 3 mm longis, sepalis petalisque punctis paucis magnis instructis, connectivo glanduloso.

A small tree about 5 m high, the young branchlets and the inflorescences sparsely brown furfuraceous-tomentose, otherwise glabrous. Branches terete, pale brownish, the branchlets more or less angled. Leaves alternate, scattered, firmly chartaceous, usually pale olivaceous when dry, oblong to oblong-elliptic, subequally narrowed to the rather prominently acuminate apex and the acute base, 12 to 22 cm long, 3.5 to 6 cm wide, entire, the glands evident on both surfaces, but especially numerous near the margins; lateral nerves 20 to 25 on each side of the midrib, prominent on the lower surface, irregular, anastomosing, the secondary nerves and reticulations distinct; petioles 1.5 to 3 cm long. Panicles in the upper axils, bipinnate, peduncled, up to 18 cm long, many flowered, the primary branches up to 6 cm in length, the flowers racemosely arranged on the ultimate branchlets, their pedicels about 3 mm long. Flowers 5-merous. Sepals ovate, obtuse or acute, spreading, nearly free, about 1.5 mm long, with few, large, prominent glands, the margins obscurely ciliate. Petals elliptic-ovate, obtuse, 3 to 3.5 mm long, with few, scattered, prominent glands, rarely nearly eglandular. Anthers lanceolate, acuminate, 2.5 mm long, the connective distinctly glandular; style about 2 mm long.

LUZON, Rizal Province, Oriud, *Loher 6146* (type); Montalban, *Loher 6145*, both collected in February, 1906: Laguna Province, Mount Maquiling, *Baker 368*, October 27, 1912, *For. Bur. 22232* Catalan, March 28, 1914, *For. Bur. 21305 Foxworthy & Catalan*, May, 1914. On Mount Maquiling it grows in the mossy forest at an altitude of about 1,000 meters.

The alliance of this species is manifestly with *Ardisia fragrans* Elm., of Mindanao, from which it is distinguished by its thinner, larger, more numerous nerved leaves.

ARDISIA BASILANENSIS sp. nov. § *Acrardisia*.

Frutex, inflorescentiis minute papilloso-glandulosis exceptis glaber; foliis oblongo-ovatis, chartaceis, usque ad 18 cm longis, in siccitate supra subolivaceis, subtus brunneis, utrinque plus minusve glandulosis, acuminatis, basi acutis, nervis utrinque circiter 18, tenuibus, distinctis; paniculis usque ad 16 cm longis, terminalibus, pedunculatis, floribus in ramulis ultimis subumbellatim dispositis, brunneo-papilloso-glandulosis; floribus 5-meris, sepalis petalisque valde glandulosis, petalis ovatis, acuminatis, circiter 8 mm longis.

A shrub 3 to 4 m high, according to the collector; glabrous except for the short, rather dense, brown, gland-like papillae on the inflorescence. Branches and branchlets brownish, terete, smooth. Leaves oblong-ovate, chartaceous, entire, 11 to 18 cm long, 4.5 to 7.5 cm wide, somewhat shining, the upper surface olivaceous or subolivaceous, the lower brownish, both surfaces with scattered, distinct, black glands, but those near the margins no more distinct than the distant ones, apex acuminate, base acute; lateral nerves slender but distinct, the primary ones about 18 on each side of the midrib, anastomosing; petioles stout, about 5 mm long. Panicles terminal, up to 16 cm long, peduncled, the branches few, distant, spreading, the lower ones up to 5 cm long, simple or rarely once branched, the flowers subumbellately arranged at the ends of the branchlets, about 10 on each branchlet, their pedicels 8 to 10 mm long. Flowers pink, 5-merous, when spread nearly 1.5 cm in diameter. Sepals 5, the free parts ovate, acute or somewhat acuminate, spreading, 2 mm long, glandular-punctate, back and margins with the minute papillae characteristic of the inflorescence. Petals nearly free, ovate, sharply acuminate, prominently glandular-punctate, about 8 mm long, 4.5 mm wide. Anthers lanceolate, acuminate, 4 mm long, the connectives inconspicuously glandular. Ovary ovoid, glabrous, 2 mm long; style 4 mm long, shorter than the petals in bud and in anthesis.

BASILAN, Binauangan, in forests, *Bur. Sci.* 15423 (type), 15437 Reillo, August, 1912, the flowers pink.

This species is well characterized by its peculiar, dark-brown, minute, rather densely arranged gland-like papillae on its inflorescences. The flowers are distinctly large in comparison with the other Philippine species of the section *Acrardisia*.

ARDISIA LAXIFLORA sp. nov. § *Acrardisia*.

Arbor glabra, circiter 11 m alta; ramis ramulisque plus minusve compressis, saltem leviter bicarinatis; foliis alternis, chartaceis,

oblongo-ovatis ad elliptico-ovatis, usque ad 14 cm longis, breviter petiolatis, apice obtuse acuminatis, basi acutis vel subacutis, utrinque glandulis multis permanifestis praeditis, nervis utrinque circiter 15, tenuibus, distinctis; paniculis terminalibus, usque ad 25 cm longis, diffusis, ramis ramulisque elongatis, ramis alternis, inferioribus usque ad 14 cm longis; floribus 5-meris, circiter 5 mm longis, longe pedicellatis, in ramulis ultimis racemose dispositis, petalis et sepalis et antheris prominente glandulosis.

A glabrous tree about 11 m high, the branches and branchlets somewhat compressed and distinctly bicarinate, the latter, together with the axis and the branches of the inflorescence, distinctly glandular-lineolate. Leaves alternate, chartaceous, oblong-ovate to ovate-elliptic, entire, 10 to 14 cm long, 3.5 to 5.5 cm wide, rather pale when dry, slightly shining, both surfaces with numerous dark-colored glands distinctly visible to the naked eye, apex blunt-acuminate, base acute or subacute; primary lateral nerves about 15 on each side of the midrib, slender, distinct, irregular, anastomosing; petioles 2 to 3 mm long or the leaves sometimes subsessile, the petiole and midrib glandular-punctate. Panicles terminal, diffuse, up to 25 cm long, tripinnate, the lower branches up to 14 cm long, these subtended by greatly reduced leaves 3 to 4 cm long, the primary branches few, spreading, the secondary ones few, 3 to 4 cm long, the flowers long-pedicelled, racemously arranged on the upper one-fourth of the ultimate branchlets, the pedicels slender, up to 1.5 cm long. Flowers 5-merous. Calyx 4 mm in diameter, the lobes spreading, ovate, obtuse, 1.2 mm long, their margins slightly ciliate, below with black, above with reddish conspicuous glands. Petals oblong-ovate, acuminate, 5 mm long, 2 mm wide, conspicuously glandular-punctate. Anthers ovate-lanceolate, acuminate, 2.5 mm long, the entire back glandular; filaments flattened, stout, about 1 mm long. Ovary ovoid, 1.2 mm long, glabrous; style 3 mm long.

MINDANAO, Lanao District, Kolambugan, *For. Bur. 25907 Alviar*, June 8, 1916, along streams, altitude about 10 meters.

A most characteristic species, readily recognized by its conspicuous glands, which are distinctly visible to the naked eye, and its very lax, ample, terminal inflorescences. Its alliance is with *Ardisia leytenensis* Merr.

ARDISIA MIRANDAE sp. nov. § *Acrardisia*?

Arbor circiter 5 m alta, glabra; foliis oblongo-ellipticis ad oblongo-obovatis, subcoriaceis, nitidis, plus minusve confertis, usque ad 8 cm longis, in siccitate brunneis, nitidis, subtus puncticulatis, apice brevissime late obtuseque acuminatis, basi acutis, nervis lateralibus obscuris, tenuibus, utrinque circiter 25; pani-

culis terminalibus vel subterminalibus, 3 ad 4 cm longis, pedunculatis, bipinnatis, paucifloris, foliis valde reductis subtensis; floribus 5-meris, in ramulis primariis subumbellatim dispositis, sepalis petalisque punctatis, petalis circiter 3 mm longis.

A tree about 5 m high, glabrous or the very young parts of the inflorescences obscurely brown papillose. Branches brownish, terete, with numerous petiolar scars. Leaves crowded near the apices of the branchlets but scarcely pseudo-verticillate, coriaceous, brown and shining when dry, entire, oblong-elliptic to oblong-obovate, apex very broadly and obscurely blunt-acuminate, base acute, the lower surface minutely puncticulate; lateral nerves very slender, obscure, about 25 on each side of the midrib; petioles dark brown when dry, 5 to 7 mm long. Panicles several on each ultimate branchlet, terminal or in the uppermost axils, 3 to 4 cm long, subtended by greatly reduced leaves or leaf-like bracts, the smaller ones about 1 cm in length. Flowers white, umbellately disposed on the primary branches, 5-merous, their pedicels about 5 mm long. Calyx 3 to 3.5 mm in diameter, the lobes orbicular, rounded, spreading, not imbricate, glandular-punctate, margins ciliate, about 1.5 mm in diameter. Petals ovate, obtuse, 3 mm long, glandular-punctate. Anthers lanceolate, acuminate, 2.5 mm long, the connectives glandular. Ovary ovoid; style 1.5 mm long.

LUZON, Camarines Province, Mount Calingan, *For. Bur.* 21686 Miranda, April 24, 1914, on the summit of a small peak in the mossy forest, altitude about 700 meters.

A very characteristic species, not certainly belonging in the section *Acrardisia*. It is characterized by its small, densely but obscurely nerved, crowded but scarcely pseudo-verticillate leaves, and by its panicles being subtended by reduced leaves or leaf-like bracts.

ARDISIA YATESII sp. nov. § *Pimelandra*.

Frutex 2 ad 4 m altus, novellis inflorescentiisque parce ferrugineo-pubescentibus exceptis glaber; foliis oblongis, chartaceis, in siccitate subolivaceis vel brunneis, nitidis, usque ad 17 cm longis, integris, basi acutis, apice tenuiter acute acuminatis, nervis utrinque circiter 15, subtus distinctis, pagina inferiore minutissime rufo-puncticulatis; infructescentibus axillaribus, solitariis, subumbellatis, petiolo subaequantibus, sepalis ovatis, glanduloso-puncticulatis, acutis, 2 mm longis, liberis vel subliberis, acutis, margine leviter ciliatis; fructibus globosis, glabris, circiter 7 mm diametro.

A shrub 2 to 4 m high, the very young growing tips of the branchlets and the infructescences somewhat ferruginous-pubes-

cent, otherwise glabrous. Branches pale-brownish, smooth, terete, the branchlets somewhat angled or compressed when dry. Leaves oblong, chartaceous, subolivaceous or brownish when dry, shining, the lower surface slightly paler than the upper, 10 to 17 cm long, 2 to 4.5 cm wide, entire, subequally narrowed to the acute base and to the slenderly acute-acuminate apex, the lower surface minutely brown-punctulate with scattered glands; lateral nerves about 15 on each side of the midrib, distinct, anastomosing, slightly curved, the ultimate reticulations evident on both surfaces; petioles 1 to 1.5 cm long. Infructescences axillary, solitary, subumbellate, the peduncles about 8 mm long, the pedicels crowded toward its tip, sparingly ferruginous-pubescent, the pedicels, in fruit, about 1 cm long, somewhat thickened upward. Calyx-lobes ovate, acute, distinctly glandular with reddish glands, about 2 mm long, nearly free, their margins minutely ciliate. Fruit globose, glabrous, smooth, about 7 mm in diameter, nearly black when mature.

LUZON, Tayabas Province, Mount Cadig, *Bur. Sci.* 25453 (type), 25494, 25389 Yates, December 14, 1916, on forested slopes, altitude 350 to 400 meters.

A species manifestly allied to *Ardisia philippinensis* A. DC. and *A. disticha* A. DC. but distinguished, among other characters, by its smaller, narrower, slenderly and sharply acuminate leaves.

ARDISIA TAYABENSIS sp. nov. § *Pyrgus*.

Frutex glaber, circiter 2 m altus; foliis oblongo-lanceolatis, usque ad 10 cm longis, integris, in siccitate brunneis, nitidis, utrinque subaequaliter angustatis, acutis vel obscure acuminatis, nervis primariis utrinque circiter 12, distinctis; paniculis terminalibus, sub fructu circiter 9 cm longis; fructibus ovoideis, circiter 8 mm longis obscure longitudinaliter striatis, sepalis glabris.

A glabrous shrub about 2 m high, the branches and branchlets brown, terete, smooth. Leaves crowded near the apices of the branches, subcoriaceous, brown and shining when dry, the lower surface slightly paler than the upper, oblong-lanceolate, 7 to 10 cm long, 2 to 2.5 cm wide, entire, subequally narrowed to the acute or slightly acuminate base and apex, both surfaces glandular-punctulate; lateral nerves about 12 on each side of the midrib, distinct, the secondary nerves and reticulations distinct on both surfaces; petioles 8 to 14 mm long. Panicles terminal, in fruit about 9 cm long, the axis stout, the primary branches scattered, spreading, 1 to 1.5 cm long, the pedicels thickened upward, about 7 mm long. Fruits ovoid, about 8 mm long, obscurely longitudinally striate, brown, shining, the persistent se-

pals broadly ovate, obtuse, about 1 mm long, eglandular, their margins glabrous or obscurely ciliate.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci.* 26527 Ramos & Edaña, September 10, 1916, in forests, altitude about 300 meters.

The alliance of this species is manifestly with *Ardisia whitfordii* Mez, from which it is distinguished by its very much smaller, narrower, fewer-nerved leaves.

ARDISIA PACHYPHYLLA sp. nov. § *Tinopsis*.

Frutex vel arbor parva, glabra, 2 ad 5 m alta; foliis coriaceis, oblongo-oblongatis ad anguste oblongo-obovatis, integris, usque ad 13 cm longis, leviter obtuse acuminatis, basi cuneatis, obscure punctulatis, in siccitate brunneis, nervis tenuibus, utrinque circiter 25, subadscendentibus; inflorescentiis terminalibus, circiter 6 cm longis, floribus 5-meris, in ramulis subumbellatim dispositis, circiter 2 cm diametro; calycibus cupulatis, lobis latissime rotundatis, obscure ciliatis, distincte punctatis, haud imbricatis; petalis circiter 9 mm longis, punctatis, antheris haud punctulatis.

A shrub or small tree 2 to 5 m high, glabrous, the branches and branchlets terete, smooth, brownish when dry. Leaves alternate, brown when dry, of the same color on both surfaces, somewhat shining, coriaceous, entire, oblong-oblongate to narrowly oblong-obovate, 9 to 13 cm long, 2.5 to 4.5 cm wide, narrowed below to the cuneate base, the apex obscurely blunt-acuminate, beneath obscurely punctulate; lateral nerves slender, somewhat ascending, about 25 on each side of the midrib, anastomosing; petioles 8 to 10 mm long. Panicles terminal, stout, subpyramidal, up to 6 cm in length, the primary branches spreading, 1.5 to 2 cm long, the flowers rather densely subracemously or subumbellately arranged toward the apices of the primary branches, their pedicels less than 10 mm long in anthesis, in fruit somewhat elongated. Calyx cup-shaped, coriaceous, about 5 mm long in anthesis, brown when dry, distinctly glandular-punctulate, slightly accrescent, the lobes 5, broadly rounded, not or very obscurely imbricate, about 2 mm long, 2.3 to 3 mm wide, their margins minutely ciliate. Corolla in full anthesis about 2 cm in diameter, pink, the tube about 3 mm long, the lobes ovate, 7 to 9 mm long, about 6 mm wide, acute or acuminate, subcoriaceous, glandular-punctulate. Anthers lanceolate, acuminate, 6 mm long, eglandular. Ovary ovoid, glabrous; style glandular-punctate, 6 mm long.

PALAWAN, Taytay, Merrill 9216 (type) 9188, April, 1913, in dry thickets and open grasslands, altitude 4 to 15 meters. BALABAC, *Bur. Sci.* 21613 Escritor, August, 1913, with immature fruits.

The alliance of this species is apparently with *Ardisia lanceolata* Roxb. from which it is distinguished by many characters especially in its slender, more numerous nerves, and much larger flowers; the prominent calyx-tube; and the calyx-lobes in bud and in anthesis scarcely overlapping, but in young fruit distinctly imbricate.

MAESA Forskål

MAESA MEGAPHYLLA sp. nov. § *Eumaesa*.

Frutex scandens, glaber; foliis late ovatis, crasse coriaceis, integris, usque ad 20 cm longis, obtusis vel late obtuseque acuminatis, basi rotundatis ad truncatis, nervis utrinque circiter 7, prominentibus; inflorescentiis terminalibus, paniculatis, multifloris, usque ad 35 cm longis, prophyllis magnis, haud cymbiformis, petalis usque ad medium connatis cum sepalis glabris tenuissime lineatis.

A scandent glabrous shrub, the branches stout, brown, reddish-brown, or sometimes nearly black when dry, prominently lenticellate. Leaves broadly ovate, thickly coraceous, entire, brownish-olivaceous when dry, somewhat shining, 10 to 20 cm long, 7 to 13 cm wide, the base very broadly rounded or truncate, apex obtuse to shortly and broadly blunt-acuminate; lateral nerves about 7 on each side of the midrib, prominent; petioles 3 to 6 cm long. Panicles terminal, very large, very many flowered, up to 35 cm long, the primary branches up to 20 cm in length. Flowers white, their pedicels 1 to 1.5 mm long, somewhat longer than the subtending bracteoles, the two prophylls subtending the flowers relatively large, ovate, acute or acuminate, 1.5 mm long. Sepals ovate, obtuse, about 0.7 mm long, very slightly lineate, margins entirely glabrous. Petals united to the middle, the lobes ovate, rounded, about 1 mm long, slenderly lineate.

LEYTE, Tigbao, near Tacloban, Wenzel 1275, 1510 (type) May 29 and July 10, 1915, the latter indicated as growing in forests at sea level.

A very characteristic species in the alliance with *Maesa cumingii* Mez, well characterized by its unusually large, coriaceous, entire, broadly ovate leaves, and its very large many-flowered panicles.

STUDIES ON PHILIPPINE RUBIACEAE, III¹

By E. D. MERRILL²

(From the Botanical Section of the Biological Laboratory, Bureau of Science, Manila, P. I.)

The present paper is essentially similar to the two preceding ones published under the same title and consists of the descriptions of apparently undescribed species in the genera *Neonaucllea*, *Hedyotis*, *Urophyllum*, *Greeniopsis*, *Ophiorrhiza*, *Plectronia*, *Ixora*, *Grumilea*, and *Psychotria*. Twenty-three new species are proposed and described, and a new name is proposed for one previously described species of *Timonius*.

RUBIACEAE.

NEONAUCLEA Merrill

NEONAUCLEA OLIGOPHLEBIA sp. nov.

Arbor circiter 8 m alta, capsulis exceptis glabra, ramis ramulisque teretibus, tenuibus; foliis in siccitate flavido-viridis, oblongis ad oblongo-obovatis, subcoriaceis, usque ad 9 cm longis, prominente obtuse acuminatis, basi angustatis, cuneatis, nervis utrinque 2 vel 3, adscendentibus, subtus prominentibus; capitulis terminalibus, solitariis vel trinis, longe pedunculatis, sub fructu circiter 8 mm diametro, capsulis anguste oblongo-obovoides, circiter 2.5 mm longis, leviter hirsutis, apice 4-denticulatis.

A tree about 8 m high, glabrous except the somewhat hirsute capsules. Branches and branchlets slender, terete, cinereous in color. Leaves opposite, oblong to oblong-obovate, subcoriaceous, when dry yellowish-green, especially on the lower surface, somewhat shining, 5 to 9 cm long, 2.5 to 3.5 cm wide, the apex rather prominently subcaudate-acuminate, the acumen rather slender, blunt, usually about 1 cm long, the base gradually narrowed, cuneate; lateral nerves 2 or 3 on each side of the midrib, promi-

¹ Merrill, E. D., Studies on Philippine Rubiaceae, I, *Philip. Journ. Sci.* 8 (1913) Bot. 31-62, t. 1; Studies on Philippine Rubiaceae, II, *op. cit.* 10 (1915) Bot. 99-144.

² Professor of botany, University of the Philippines.

nent on the lower surface, ascending, curved-anastomosing, the reticulations distinct, slender, rather lax; petioles 5 to 8 mm long. Heads terminal, solitary or in threes, the slender peduncles about 3 cm long, the bract-scars at about the middle, the heads in fruit globose, dense, about 8 mm in diameter. Capsules crowded, somewhat angular, oblong-obovoid, about 2.5 mm long, the upper part hirsute, the persistent calyx-teeth 4, very short.

LEYTE, Tigbao, near Tacloban, Wenzel 1608, August 22, 1915, in forests at sea level.

A rather characteristic species in the group with *Neonauclea gracilis* (Vid.) Merr., and *N. philippinensis* (Vid.) Merr., but rather nearer the latter. It is distinguished by its yellowish-green, fewer-nerved leaves.

HEDYOTIS Linnaeus

HEDYOTIS LUZONIENSIS sp. nov.

Frutex circiter 1 m altus, ramosus, hispidus, ramulis quadrangulatis; foliis oblongo-ovatis ad elliptico-ovatis, usque ad 5 cm longis, obtusis, scabridis, subtus praesertim ad costa nervisque hispidis, nervis utrinque circiter 4; inflorescentiis axillaribus, solitariis, pedunculatis, 3 ad 6 cm longis; capsulis anguste obovoideis, hispidis, circiter 5 mm longis.

An erect branched shrub about 1 m high, parts distinctly hispid. Branches and branchlets dull-brownish, the latter distinctly 4-angled, slender. Leaves pale-greenish when dry, slightly shining, firmly chartaceous, oblong-ovate to elliptic-ovate, 2.5 to 5 cm long, 1.2 to 2.2 cm wide, subequally narrowed to the obtuse apex and to the acute base, scabrous, the lower surface hispid, especially on the midrib and lateral nerves; lateral nerves about 4 on each side of the midrib, not prominent, curved, anastomosing; petioles hispid, 2 to 4 mm long; stipules broad, hispid, abruptly contracted into a 3 mm long beak. Inflorescences axillary, solitary, peduncled, 3 to 6 cm long, 2.5 to 3 cm wide, hispid, the branches few, spreading, the primary bracts foliaceous, oblong, obtuse, narrowed below, 5 to 6 mm long, secondary ones spatulate, 2 to 3 mm long, the bracteoles linear, 1 to 1.5 mm long. Calyx immediately after anthesis about 3 mm long, the lobes 4, oblong-ovate, obtuse, 1 mm long. Capsules oblong-obovoid, 5 mm long, base acute, hispid, their pedicels 2 to 3 mm long.

LUZON, Tayabas Province, Mount Dingalan, Bur. Sci. 26580 Ramos, September 8, 1916, in forests, altitude at least 300 meters.

This species has much the aspect of *Hedyotis elmeri* Merr., but differs in its hispid indumentum and its smaller, fewer-nerved leaves. It is at once distinguished from *H. macgregorii* Merr. by its elongated inflorescences.

UROPHYLLUM Wallich

UROPHYLLUM LUZONIENSE sp. nov.

Frutex erectus, glaber; foliis coriaceis, oblongo-ellipticis ad oblongo-ovatis, usque ad 7 cm longis, olivaceis, nitidis, utrinque subaequaliter angustatis, basi acutis, apice acuminatis, nervis utrinque 7 vel 8, subtus prominentibus; fructibus axillaribus, solitariis, longe pedicellatis, urceolato-ovoideis, circiter 5 mm diametro.

An erect glabrous shrub about 2 m high, the branches rather stout, subterete, brownish, about 5 mm in diameter, the branchlets smooth, dark brown, somewhat shining. Leaves coriaceous, olivaceous when dry, shining, of about the same color on both surfaces, oblong-elliptic to oblong-ovate, 4 to 7 cm long, 2 to 3.5 cm wide, subequally narrowed to the acute base and to the somewhat acuminate apex; lateral nerves 7 or 8 on each side of the midrib, very prominent on the lower surface, curved, anastomosing, the reticulations prominent; petioles 1 to 1.5 cm long; stipules ovate, acute, deciduous, about 7 mm long. Fruits axillary, solitary, urceolate-ovoid and black when dry, about 5 mm in diameter, the persistent calyx-rim truncate, the pedicels 2 to 2.5 cm long.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci.* 26522 Ramos & Edaño, September 8, 1916, in forests, altitude at least 300 meters.

The alliance of this species is with *Urophyllum bataanense* Elm., from which it is distinguished by its smaller, fewer-nerved leaves and its long-peduncled fruits.

UROPHYLLUM MICROPHYLLUM sp. nov.

Frutex, plus minusve ciliato-pilosus; foliis oblongo-ovatis, firmiter chartaceis vel subcoriaceis, usque ad 2.5 cm longis, acuminatis, basi acutis, nervis utrinque 5 vel 6, subtus prominentibus; fructibus axillaribus, solitariis, breviter pedicellatis, ovoideis, circiter 2 mm diametro, pubescentibus, calycis lobis 4, late triangularis, circiter 1 mm longis.

An erect, much-branched shrub about 2 m high, the branchlets, petioles, margins of the leaves, and the midrib and lateral nerves on the lower surface prominently ciliate-pilose with soft, appressed or subappressed, pale hairs. Branches terete, grayish-brown, glabrous or nearly so. Leaves oblong-ovate, firmly chartaceous to subcoriaceous, 2 to 2.5 cm long, 0.8 to 2.3 cm wide, brownish-olivaceous or pale when dry, base acute, apex rather prominently acuminate, the upper surface glabrous or, when young, sparingly pilose on the midrib, the margins ciliate-pilose; lateral nerves 5 or 6 on each side of the midrib,

rather prominent on the lower surface, anastomosing, curved, the reticulations not prominent, the nerves and midrib ciliate-pilose on the lower surface; petioles densely ciliate-pilose, 2 to 4 mm long; stipules lanceolate, acuminate, pubescent, about 6 mm long. Fruits axillary, solitary, pubescent, ovoid or cup-shaped, about 4 mm in diameter, their pedicels pubescent, 1 to 2 mm long, the bracteoles oblong-lanceolate, pubescent, as long as the pedicels, the calyx-teeth 4, broadly triangular, somewhat acuminate, pubescent, about 1 mm long.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26389 Ramos & Edaño, August 20, 1916, in forests near the summit of the mountain, altitude about 1,000 meters.

A very characteristic species not closely allied to any other form known to me. It is readily recognized by its indumentum; its small leaves; and its solitary, short-pedicelled, pubescent fruits.

UROPHYLLUM SUBGLABRUM sp. nov.

Frutex vel arbor parva, partibus junioribus parcissime ciliato-pilosus glabrescentibus; foliis chartaceis, anguste oblongis, usque ad 15 cm longis, prominente acuminatis, basi acutis, nervis utrinque circiter 9, stipulis oblongo-ovatis, circiter 6 mm longis; inflorescentiis axillaribus, solitariis, pedunculatis, depauperato umbellatis, fructibus ovoideis, circiter 6 mm longis, longe pedicellatis, parcissime adpresse ciliatis.

A shrub or small tree, the stipules, petioles, and leaves with few, widely scattered, long, white, ciliate hairs, in age glabrous or nearly so. Branches pale-brownish, terete, glabrous, the branchlets obscurely rounded-angled or somewhat compressed, the internodes 2 to 3 cm long. Leaves pale-olivaceous when dry, slightly shining, narrowly oblong, chartaceous, 9 to 15 cm long, 3 to 4 cm wide, narrowed below to the acute base, and above to the rather prominently acuminate apex, the acumen slender, blunt; lateral nerves about 9 on each side of the midrib, slender, curved, anastomosing; petioles 1 to 1.5 cm long; stipules oblong-ovate, subacute, about 6 mm long; infructescences axillary, solitary, depauperate umbellate, each bearing from 1 to 3 fruits, the peduncles 1 to 1.5 cm long, the pedicels as long as the peduncles. Fruits yellow when fresh, fleshy, when dry dark brown, ovoid, about 6 mm in diameter, sparingly appressed-ciliate with scattered, long, white hairs, the calyx-teeth more pubescent than the tube, acute, short.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26507 Ramos & Edaño, September 6, 1916, on dry slopes, altitude about 100 meters, known to the Balugos as *tarambuyen*.

In many respects this species resembles *Urophyllum arboreum* (Blume) Korth. (*U. glabrum* Wall.), from which it is readily distinguished by its very sparse indumentum; its few-flowered umbels; and its much shorter stipules.

GREENIOPSIS Merrill

GREENIOPSIS DISCOLOR sp. nov.

Arbor circiter 5 m alta, foliis subtus densissime minuteque albido-lanosis et paniculis brunneo-pubescentibus exceptis glabra; foliis confertis, coriaceis, anguste oblongo-obovatis, supra brunneis, nitidis, subtus albidis vel griseis, usque ad 12 cm longis, acuminatis, basi angustatis, acutis, nervis utrique 15 ad 18, subtus valde prominentibus, adscendentibus; paniculis terminalibus, pedunculatis, usque ad 15 cm longis, multifloris, brunneo-pubescentibus; fructibus subellipsoideis, circiter 5 mm longis.

A tree about 5 m high, the panicles brown-pubescent, the lower surface of the leaves densely and minutely white-lanate, otherwise glabrous. Branches terete, brownish. Leaves crowded toward the apices of the branchlets, coriaceous, narrowly oblong-obovate, 8 to 12 cm long, 3 to 5 cm wide, acuminate, gradually narrowed below to the cuneate base, the upper surface dark brown and shining when dry, the lower white or grayish; lateral nerves 15 to 18 on each side of the midrib, prominent beneath; petioles brown, 1 to 2 cm long; stipules lanceolate, acuminate, dark brown, glabrous, 12 to 15 mm long. Panicles terminal, peduncled, up to 15 cm long, the peduncles 4 cm long or less, the branches opposite, the lower ones up to 6 cm long, brown-pubescent, many flowered, the flowers scorpioidly arranged on the ultimate branchlets. Flowers yellowish-white, 5-merous, their pedicels 1 to 3 mm long. Calyx urceolate, pubescent, about 2 mm long, the lobes reniform-ovate, truncate-rounded, less than 1 mm long. Corolla 4 mm long, somewhat funnel-shaped, pubescent, the lobes 5, reniform; about 1 mm long and 2 mm wide. Style slender, 3 mm long; stigma capitate. Anthers oblong, 1.2 mm long. Capsule subellipsoid, brown when dry, pubescent, about 5 mm long.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26448 Ramos & Edaño, August 15, 1916, on forested slopes, altitude about 300 meters, known to the Balugos as *pangalimanan*.

A most characteristic species, at once distinguished from all other known forms of the genus by its small leaves, which are dark brown, glabrous, and shining on the upper surface, and densely but minutely white-lanate on the lower surface. The midribs and lateral nerves on the lower surface are dark brown in striking contrast to the pale dense indumentum.

GREENIOPSIS MEGALANTHA sp. nov.

Arbor circiter 10 m alta, partibus junioribus inflorescentiisque exceptis glabra; foliis coriaceis, oblongo-ovatis ad oblongo-lanceolatis, nitidis, brunneo-olivaceis, usque ad 25 cm longis, tenuiter acuminatis, basi acutis, nervis utrinque 11 ad 13, prominentibus; inflorescentiis longe pedunculatis, dense adpresse pubescentibus; floribus numerosis, circiter 1.5 cm longis.

A tree about 10 m high, glabrous except the inflorescences and the younger parts. Branches glabrous, smooth, terete or somewhat compressed, the branchlets compressed, usually dark, appressed cinereous-pubescent. Leaves coriaceous, oblong-ovate to oblong-lanceolate, brownish-olivaceous, shining, and of about the same color on both surfaces when dry, glabrous, narrowed upward to the slenderly acuminate apex, the base acute; lateral nerves 11 to 13 on each side of the midrib, prominent, curved, the reticulations very slender; petioles about 2.5 cm long, nearly black when dry, glabrous; stipules lanceolate, slenderly acuminate, brownish when dry, ultimately glabrous, about 2 cm long. Panicles terminal, all parts densely appressed-pubescent with pale-brownish or cinereous hairs, usually trichotomously branched, the peduncles about 14 cm long, about equalling the flower-bearing portions. Flowers numerous, white, cymosely arranged, about 1.5 cm long, somewhat funnel-shaped. Calyx somewhat campanulate, densely pubescent, about 7 mm long, the lobes subreniform, 2 mm long and 3 mm wide. Corolla densely pubescent externally, the lower 3 mm of the tube cylindric, then enlarged, inside densely bearded below the insertion of the stamens, the lobes somewhat recurved, reniform, 3 mm long, 5 mm wide. Anthers 2 mm long. Style glabrous, 8 mm long. Stigma much thickened, somewhat cleft, about 2 mm long.

MINDANAO, Surigao Province, Cayungan, Adlay Barrio, *For. Bur.* 26004 Mallonga, June 22, 1916, along streams, altitude about 15 meters.

A most characteristic species, at once distinguished among all known forms of this genus by its large flowers.

OPHIORRHIZA Linnaeus**OPHIORRHIZA OBLONGILIMBA** sp. nov.

Fruticosus, erectus, ramosus, usque ad 25 cm altus, ramulis junioribus subtus foliis ad costa nervisque et inflorescentiis puberulis vel brevissime pubescentibus; foliis oblongis ad oblongo-lanceolatis, usque ad 6.5 cm longis et 1 cm latis, olivaceis, subtus pallidioribus, integris, nervis utrinque 6 ad 8; stipulis 2 ad 3 mm longis, longe acuminatis; cymis terminalibus, solitariis, pe-

dunculatis, paucifloris; floribus circiter 4 mm longis; fructibus subtruncatis, glabris, 2.5 ad 3 mm longis, 5 ad 6 mm latis.

An erect, somewhat branched undershrub, 10 to 25 cm high, the stems glabrous, woody, brownish-gray, terete, about 3 mm in diameter, branched at or from above the base. Branchlets appressed brownish-puberulent with short, dirty-brown hairs. Leaves membranaceous, oblong to oblong-lanceolate, 3 to 6.6 cm long, 6 to 10 mm wide, apex acute to subobtus, base narrowed, acute, entire, the upper surface dark olivaceous, somewhat shining, glabrous or nearly so, the lower surface paler, puberulent or short-pubescent on the midrib and lateral nerves; nerves 6 to 8 on each side of the midrib, slender, curved, not prominent; petioles slender, 5 to 10 mm long; stipules 2 to 3 mm long, long and slenderly acuminate from an ovate base. Cymes terminal, solitary, few-flowered, slightly branched, puberulent, each with from about 5 to 9 flowers. Flowers 5-merous, about 4 mm long. Calyx-tube globose, minutely puberulent, 1.5 mm long, the minute teeth ovate, acute, 0.2 mm long. Fruit glabrous, compressed, subtruncate, 2.5 to 3 mm long, 5 to 6 mm wide. Seeds numerous, about 0.3 mm in diameter.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27139 (type) 27335 *Ramos*, March, 1917, in forests along streams at low altitudes.

This species is characterized by its erect, woody stems; its oblong to oblong-lanceolate leaves, which do not exceed 1 cm in width; and its small, few-flowered, slenderly pedicelled cymes. It conforms closely with the description of *Ophiorrhiza oblongifolia* DC., the type of which was from Luzon, but is entirely different from de Candolle's species as currently interpreted, while the leaves are not velutinous beneath.

TIMONIUS de Candolle

TIMONIUS SAMARENSIS nom. nov.

Timonius macrophyllus Merr. in *Philip. Journ. Sci.* 5 (1910) Bot. 246, non Valetton, 1909.

This new name is necessarily for the Samar plant I described as *Timonius macrophyllus*, as Valetton³ published the same combination for the species he considered under the name *Timonius amboinensis* (Miq.) Boerl., in a note following his description. *Timonius macrophyllus* Valetton was based on *Greenea macrophylla* Teysm. & Binn., this name antedating *Polyphragmon amboinicum* Miq. by one year. *Timonius macrophyllus* Valetton was overlooked by the compilers of the fourth supplement to *Index Kewensis*.

PLECTRONIA Linnaeus

PLECTRONIA ELLIPTICA sp. nov.

Frutex circiter 1 m altus, petiolis inflorescentiis et subtus foliis

³ Bull. Dépt. Agr. Ind. Néerl. 26 (1909) 45.

parce ciliato-setosus; foliis ellipticis, subcoriaceis, usque ad 12 cm longis, in siccitate brunneis vel olivaceo-brunneis, utrinque aequaliter angustatis, basi acutis, apice acutis ad obscure obtuseque acuminatis, nervis utrinque 5 ad 6, distinctis; inflorescentiis axillaribus, solitariis, umbellatis, breviter, pedunculatis, 6- ad 8-floris, bracteis binis 7 ad 8 mm longis valde acuminatis instructis.

An erect shrub about 1 m high, according to the collector. Branches terete, smooth, brownish or yellowish-brown, glabrous, the branchlets brown, slender, shining. Leaves subcoriaceous or firmly chartaceous, elliptic to oblong-elliptic, 7 to 12 cm long, 4 to 5.5 cm wide, brownish or brownish-olivaceous when dry, of the same color on both surfaces, shining, the apex acute to shortly blunt-acuminate, base acute, the upper surface glabrous, the lower ciliate-setose with scattered pale hairs especially on the midrib and nerves; lateral nerves 5 or 6 on each side of the midrib, distinct, scarcely anastomosing, the secondary ones and reticulations obsolete; petioles sparingly ciliate-setose, 2 to 5 mm long; stipules prominently acuminate from a somewhat broadened base, 6 to 7 mm long. Umbels axillary, solitary, 6- to 8-flowered, their peduncles about 2 mm long, each umbel subtended by two conspicuous bracts 7 to 8 mm in length, these prominently acuminate from the 3 to 4 mm long base, obscurely keeled; bracteoles numerous, ovate, 2 mm long or less. Pedicels 2 to 4 mm long, sparingly ciliate-setose. Calyx short, about 2 mm in diameter, the teeth ovate, acute, 0.5 mm long or less.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26327 Ramos & Edaña, August 21, 1916, from the summit of the mountain, altitude not indicated.

A species well characterized by the two, conspicuous, prominently acuminate bracts subtending the few-flowered, short-peduncled umbels; and the scattered ciliate-setose indumentum.

PLECTRONIA CORDATA sp. nov.

Frutex, foliis floribusque in siccitate nigris, ramulis junioribus subtus foliis inflorescentiisque dense pubescentibus; foliis chartaceis vel subcoriaceis, oblongis ad oblongo-ovatis, usque ad 12 cm longis, brevissime petiolatis, apice acutis, basi late rotundatis cordatisque, nervis utrinque circiter 5; floribus numerosis, axillaribus, fasciculatis, 5-meris, breviter pedicellatis, calycibus pubescentibus, circiter 1 mm longis.

A shrub about 1 m high, according to the collector; the vegetative parts rather uniformly black when dry. Branches and branchlets terete, the former glabrous, brownish, the latter rather densely pubescent with short, pale or dark hairs. Leaves

firmly chartaceous or subcoriaceous, oblong to oblong-ovate, 7 to 12 cm long, 3.5 to 5.5 cm wide, apex acute, base broadly rounded and distinctly cordate, the upper surface glabrous, shining, the lower densely and rather softly pubescent, the indumentum blackish; lateral nerves about 5 on each side of the midrib, rather prominent, laxly anastomosing; petioles 2 to 4 mm long; stipules truncate, about 1 mm long. Flowers white, axillary, subfasciculate, rather numerous, black when dry, their pedicels slender, pubescent, 2 to 3 mm long, the bracteoles ovate, pubescent, acute, 0.5 mm long. Calyx about 1 mm long, pubescent, the teeth 5, broadly ovate, acute, 0.5 mm long. Petals, in bud, 1 mm long.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci. 26549* Ramos & Edaño, August 25, 1916, on dry slopes, altitude about 200 meters.

A species well characterized by its vegetative and floral parts being uniformly black or blackish when dry; its short-petioled, cordate leaves; and its indumentum. It is not closely allied to any other species known to me.

PLECTRONIA OBOVATIFOLIA sp. nov.

Frutex erectus, glaber, ramulis plus minusve quadrangulatis; foliis obovatis, crasse coriaceis, usque ad 7 cm longis, apice rotundatis, basi angustatis, acutis vel decurrento-acuminatis, nervis utrinque 3 vel 4, subtus valde prominentibus et in axillis glandulis magnis instructis; inflorescentiis axillaribus, umbellatis, breviter pedunculatis, circiter 6-floris.

An erect shrub or small tree, entirely glabrous, the branches and branchlets more or less quadrangular, brownish, the internodes 1 to 2 cm long. Leaves thickly coriaceous, obovate, 4.5 to 7 cm long, 2.5 to 4 cm wide, very dark olivaceous to somewhat brownish when dry, shining, apex rounded, base narrowed, acute or decurrent-acuminate; lateral nerves 3 or 4 on each side of the midrib, very prominent and supplied with large axillary glands on the lower surface, somewhat ascending, curved, evanescent or very obscurely anastomosing, the secondary nerves and reticulations mostly obsolete; petioles 3 to 8 mm long; stipules coriaceous, broadly ovate, rather abruptly and prominently acuminate, 5 to 6 mm long. Umbels about 6-flowered, axillary, solitary, their peduncles rather stout, black when dry, 3 to 5 mm long. Bracts subtending the flowers ovate, acute, about 4 mm long. Pedicels 3 to 4 mm long. Calyx about 2 mm in diameter, shallow, obscurely toothed, the teeth subacute or acuminate. Petals in bud about 3 mm long.

LUZON, Tayabas Province, Mount Dalindangan, *Bur. Sci. 26526* Ramos

& Edaño, September 9, 1916, on forested slopes at medium altitudes, locally known to the Balugos as *taratapak*.

The alliance of this species is manifestly with *Plectronia gynochthodes* Baill. (*P. umbellata* K. Sch.), from which it is readily distinguished by its differently shaped, very coriaceous leaves and by the prominent glands in the axils on the lower surface.

PLECTRONIA SUBSESSILIFOLIA sp. nov.

Frutex circiter 2 m altus, glaber, ramis teretibus, ramulis plus minusve compressis; foliis coriaceis vel subcoriaceis, brevissime petiolatis, ellipticis ad obovato-ellipticis, usque ad 9 cm longis, basi acutis, apice obtusis ad latissime et obscure acuminate, in siccitate olivaceis vel brunneo-olivaceis, nitidis, nervis utrinque 5 vel 6, subtus prominentibus, in axillis prominente glandulosis; fructibus axillaribus, pedicellatis, solitariis vel subsolitariis, obconicis, truncatis, circiter 7 mm longis, prominente longitudinaliter 8-carinatis.

A glabrous erect shrub about 2 m high, the branches terete, grayish, the branchlets more or less compressed, sometimes sulcate, brownish-olivaceous, smooth. Leaves coriaceous or subcoriaceous, elliptic to obovate-elliptic, brownish-olivaceous and shining when dry, 7 to 9 cm long, 3.5 to 4.5 cm wide, base acute, apex obtuse to very broadly and obtusely acuminate; lateral nerves 5 or 6 on each side of the midrib, prominent on the lower surface, somewhat ascending, slightly curved, scarcely anastomosing, prominently glandular in the axils, the secondary nerves and reticulations obsolete; petioles 2 mm long or less; stipules ovate-lanceolate, acuminate, 4 mm long. Fruits axillary, solitary or rarely two on a very short peduncle, yellow when mature, dark brown when dry, obconic, truncate, about 7 mm long, with eight prominent longitudinal keels especially prominent at the tip of the fruit, narrowed below, the pedicels about 5 mm long.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27205 Ramos & Edaño, March 2, 1917, in thickets at low altitudes.

In appearance this species approximates *Plectronia obovatifolia* Merr., but is easily distinguished by its more numerous lateral nerves. The turbinate, truncate, prominently keeled fruits are most characteristic, the keels being evident in the very youngest fruits.

IXORA Linnaeus

IXORA ILOCANA sp. nov.

Frutex parvus, erectus, glaber, ramis ramulisque teretibus; foliis oblongis, chartaceis, breviter petiolatis, usque ad 6 cm longis, acutis vel minute acuminatis, basi acutis, nervis utrinque circiter 12, tenuibus, anastomosantibus; stipulis circiter 3 mm longis, e basi ovatis longe tenuiter caudato-acuminatis; infruc-

tescentiis terminalibus, circiter 2 cm longis, sessilibus vel breviter pedunculatis, simplicibus vel dichotomis, fructibus 1 ad 4, globosis, circiter 6 mm diametro, tenuiter pedicellatis.

An erect glabrous shrub said by the collector to be about 1 m high, the branches and branchlets slender, terete, grayish to brown, the latter about 1 mm in diameter. Leaves oblong, chartaceous, rather pale when dry, of about the same color on both surfaces, somewhat shining, 4 to 6 cm long, 1 to 2 cm wide, slightly and subequally narrowed to the acute or minutely acuminate apex and the acute base; lateral nerves about 12 on each side of the midrib, slender, anastomosing, slightly more prominent than are the secondary ones and the lax reticulations; petioles 2 mm long; stipules about 3 mm long, prominently caudate-acuminate from an ovate base. On some branches supplementary pairs of greatly reduced, linear-oblong, 5 to 10 mm long leaves are borne immediately above the normal ones. Infructescences terminal, sessile or shortly peduncled, simple or once forked, the primary branches simple or once forked, the whole infructescence 2 cm long or less. Fruits 1 to 4, globose, reddish-yellow when fresh, brown when dry, smooth, shining, about 6 mm in diameter, the pedicels 5 to 7 mm long, the bracts and bracteoles linear-lanceolate, acuminate, 2 to 3 mm long.

LUZON, Ilocos Norte Province, Burgos, *Bur. Sci.* 27325 Ramos, March 11, 1917, in forests along streams at low altitudes.

This species is apparently most closely allied to *Ixora gracilipes* Merr., and is characterized by its unusually small leaves and depauperate, slender infructescences. It differs from *Ixora gracilipes* notably in its thinner leaves; caudate-acuminate, not truncate stipules; and much shorter infructescences.

GRUMILEA Gaertner

GRUMILEA LAGUNENSIS sp. nov.

Frutex erectus, partibus junioribus subtus foliis ad costa nervisque et inflorescentiis fusco-pubescentibus; foliis chartaceis, oblongo-ovatis, usque ad 20 cm longis, acuminatis, basi acutis, nervis utrinque circiter 17, subadscendentibus, subtus prominentibus; infructescentiis brevibus, fructibus paucis, oblongo-obovoideis, in siccitate brunneis, glabris, 1 cm longis, prominente longitudinaliter sulcatis, albumine valde ruminato.

An erect shrub, more or less brown-pubescent. Branches terete, grayish-brown, smooth, glabrous, the younger branchlets rather densely brown-pubescent. Leaves chartaceous, oblong-ovate, about 20 cm long, 9 to 10 cm wide, narrowed upward to the acuminate apex, base acute, olivaceous when dry, the upper surface glabrous, slightly shining, the lower prominently brown-

pubescent on the midrib and lateral nerves; lateral nerves about 17 on each side of the midrib, very prominent on the lower surface, subascending, anastomosing; petioles pubescent, 1.5 to 2 cm long. Panicles in fruit brown-pubescent, 2 to 3 cm long. Fruits few, yellow when fresh, when dry dark brown, glabrous, oblong-obovoid, 1 cm long, prominently sulcate longitudinally with usually eight distinct keels. Albumen prominently ruminated throughout.

LUZON, Laguna Province, San Antonio, *Bur. Sci.* 23826 Ramos, October 19, 1915, in damp forests.

This species in vegetative characters somewhat resembles *Grumilea velutina* Elm., from which it is distinguished at once by its brown, not pale indumentum, and more numerous nerved leaves.

GRUMILEA PROPINQUA sp. nov.

Frutex erectus, partibus junioribus subtus foliis ad costa nervisque et inflorescentiis rubiginoso-pubescentibus; foliis oblongo-obovatiis ad oblongo-ellipticis, usque ad 14 cm longis, in siccitate cupreis, acutis vel obscure acute acuminatis, deorsum angustatis, basi cuneatis, nervis utrinque 8 ad 10. Inflorescentiis terminalibus, brevissime pedunculatis vel e basi ramosis, circiter 4 cm longis; floribus in ramulis ultimis subcapitato-dispositis, 6 ad 7 mm longis; fructibus junioribus rubiginoso-pubescentibus.

An erect shrub, about 1 m high according to the collector, prominently rubiginous-pubescent, all parts cupreous when dry. Branches terete, glabrous, brown, the branchlets rather densely pubescent. Leaves firmly chartaceous to subcoriaceous, oblong-obovate to oblong-elliptic, 9 to 14 cm long, 3.5 to 5.5 cm wide, apex acute or shortly acute acuminate, usually narrowed below, base cuneate, the upper surface glabrous, shining, the lower minutely scaberulous from the short scattered hairs on the surface, the midrib and nerves rather densely pubescent; petiole pubescent, 5 to 8 mm long; stipules triangular-ovate, acuminate, pubescent, about 6 mm long. Panicles terminal, about 4 cm long, shortly peduncled or branched from the base, rubiginous-pubescent, the branches few, the flowers subsessile and densely crowded at the tips of the branchlets. Flowers white, 6 to 7 mm long. Calyx about 3 mm long, pubescent, cuneate, the teeth ovate, acute, ciliate, 1 mm long. Corolla pubescent externally, the tube about 2 mm long, lobes as long as the tube, oblong, obtuse. Young fruits subellipsoid, about 7 mm long, not sulcate, more or less rubiginous-pubescent.

LUZON, Tayabas Province, Mount Dingalan, *Bur. Sci.* 26570 Ramos & Edaño, August 27, 1916 (type): Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26343 Ramos & Edaño, August 6, 1916, in forests.

The alliance of this species is manifestly with *Grumilea rubiginosa* (Elm.) Merr., from which it is distinguished by its smaller, fewer-nerved leaves and its much shorter inflorescences. In *Grumilea rubiginosa* the panicles are long-peduncled, while in the present species they are usually branched from the base.

GRUMILEA FUSCA sp. nov.

Frutex erectus, circiter 1 m altus, ramulis petiolis foliis ad costa nervisque et inflorescentiis prominente fusco-pubescentibus; foliis in siccitate brunneis, oblongo-ellipticis, usque ad 18 cm longis, utrinque subaequaliter angustatis, apice acutis ad leviter obtusis, basi acutis, nervis utrinque 13 ad 15, subtus valde prominentibus; inflorescentiis confertis, rubiginoso-pubescentibus, calycis dentibus lanceolatis, acuminatis; fructibus obovoideis, glabris, in siccitate leviter rugosis; seminibus 1 vel 2, albumine valde ruminato.

An erect, simple or sparingly branched shrub 0.7 to 1 m high, the stems terete, brown, glabrous, about 8 mm in diameter, the young branchlets densely brownish-rubiginous-pubescent, the hairs somewhat crisped, spreading. Leaves oblong-elliptic, brown when dry, shining, chartaceous, 12 to 18 cm long, 5 to 8 cm wide, subequally narrowed to the acute or somewhat obtuse apex and to the acute base, the upper surface entirely glabrous, the lower prominently brown-pubescent on the midrib and lateral nerves; the latter 13 to 15 on each side of the midrib, very prominent on the lower surface, curved, obscurely anastomosing close to the margin, the reticulations prominent; petioles densely pubescent, 2 to 3 cm long; stipules densely pubescent, ovate to ovate-lanceolate, apiculate-acuminate. Young inflorescence dense, sessile, subcapitate, the flowers crowded. Calyx rubiginous-pubescent, subsessile, the tube short, the lobes lanceolate, acuminate, 1 to 1.2 mm long. Corolla-lobes oblong-ovate, acuminate, 3 mm long. Panicle in fruit 4 cm long, branched from the base, densely pubescent, the indumentum brown rubiginous. Fruits dark red when fresh, dark brown when dry, obovoid, about 8 mm long, not at all longitudinally ridged or sulcate but somewhat rugose when dry, 1- or 2-seeded, when 1-seeded slightly inequilateral, the seeds plano-convex, very prominently ruminate throughout.

Luzon, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26232 Ramos & Edaño, August 14, 1916 (type): Tayabas Province, Mount Dingalan, *Bur. Sci.* 26600 Ramos & Edaño, August 25, 1916, altitude 200 to 300 meters.

This species is well characterized by its oblong-elliptic leaves, which are brown when dry, its characteristic indumentum, and its prominently

ruminate seeds. It does not appear to be closely related to the other known Philippine representatives of the genus.

GRUMILEA YATESII sp. nov.

Frutex glaber, erectus, 1 ad 2 m altus; foliis oblongo-ellipticis ad obovato-ellipticis, usque ad 20 cm longis, in siccitate subolivaceis, nitidis, apice breviter obtuse acuminatis, basi acutis, nervis utrinque circiter 15, subtus valde prominentibus; infructescentiis terminalibus, brevibus, breviter pedunculatis vel e basi ramosis, 2 ad 4 cm longis; fructibus subglobosis, circiter 8 mm diametro, in siccitate nigris, haud sulcatis; seminibus plano-convexis, albumine plus minusve ruminato.

An erect glabrous shrub 1 to 2 m high, the branches terete, brownish or dark reddish brown, 5 to 7 mm in diameter. Leaves firmly chartaceous, oblong-elliptic to obovate, elliptic, 12 to 20 cm long, 6 to 10 cm wide, the upper surface usually olivaceous, shining, the lower paler, apex abruptly and shortly blunt-acuminate, base acute; lateral nerves about 15 on each side of the midrib, very prominent on the lower surface, somewhat curved, obscurely anastomosing close to the somewhat revolute margins, the reticulations distinct; petioles 1 to 1.5 cm long; stipules deciduous. Infructescences terminal, 2 to 4 cm long, branched from the base or shortly peduncled, the branches spreading, short. Fruits subglobose, dark red to nearly black when mature, the pericarp somewhat fleshy, when dry nearly black, smooth, about 8 mm in diameter. Seeds plano-convex, the albumen somewhat ruminato.

Luzon, Tayabas Province, Mount Cadig, *Bur. Sci.* 25518 (type), 25417, Yates, December 11 and 16, 1916, in forests at low altitudes.

This species somewhat resembles *Psychotria plumierifolia* Elm., but is distinguished in many characters, notably in its very much shorter infructescences, which in Elmer's species are about one-half as long as the leaves.

GRUMILEA BRACHYBOTRYS sp. nov.

Frutex vel arbor parva, glabra; foliis firmiter chartaceis vel subcoriaceis, oblongis, usque ad 10 cm longis, in siccitate pallide olivaceis, utrinque concoloribus, basi acutis, apice breviter obtuse acuminatis, nervis utrinque circiter 12; infructescentiis terminalibus, pedunculatis, circiter 2 cm longis; fructibus paucis, obovoideis, 1 ad 1.2 cm longis, in siccitate brunneis, obscure sulcatis; seminibus valde bicarinatis, albumine ruminato.

A shrub or a small tree, entirely glabrous. Branches terete, brownish, the branchlets somewhat compressed. Leaves oblong, firmly chartaceous or subcoriaceous, pale olivaceous, somewhat shining, and of the same color on both surfaces when dry, base

acute, apex somewhat blunt-acuminate, 7 to 10 cm long, 2 to 3.5 cm wide, subequally narrowed at both ends; lateral nerves about 12 on each side of the midrib, distinct, anastomosing; petioles 8 to 12 mm long. Infructescences terminal, about 2 cm long, one or two terminating each branchlet, simple, each bearing one or two sessile fruits. Fruits obovoid, 10 to 12 mm long, dark brown when dry, obscurely sulcate. Seeds very prominently bicarinate, the keels thin, about 2 mm high. Albumen ruminant.

LUZON, Nueva Ecija Province, Mount Umingan, *Bur. Sci.* 26256 Ramos & Edaña, August, 1916.

In vegetative characters this species somewhat resembles *Grumilea subalpina* (Elm.) Merr., but its leaves are smaller. It differs notably from this species in its fewer and very much larger fruits and in its very prominent bicarinate seeds.

GRUMILEA ILOCANA sp. nov.

Frutex glaber, erectus; foliis oblongo-obovatis ad obovatis, subcoriaceis, usque ad 9 cm longis, obtusis ad late obtuseque acuminate, basi cuneatis, nitidis, in siccitate pallide brunneis, nervis utrinque circiter 9, tenuibus, distinctis; stipulis oblongo-ovatis, obtusis, circiter 3 mm longis, caducis; infructescentiis 2.5 ad 5 cm longis, pedunculatis vel e basi ramosis; fructibus paucis, obovoideis, teretibus, in siccitate brunneis, circiter 7 mm longis; seminibus plano-convexis, laevis, albumine valde ruminato.

An erect glabrous shrub, the branches terete, brownish or grayish-brown, somewhat wrinkled, the branchlets compressed, brownish, smooth. Leaves subcoriaceous, smooth, oblong-obovate to obovate, 5 to 9 cm long, 2.5 to 4 cm wide, shining, brownish or pale brownish and of about the same color on both surfaces when dry, apex obtuse to shortly and broadly obtuse-acuminate, narrowed below to the cuneate base; lateral nerves about 9 on each side of the midrib, slender, distinct, obscurely anastomosing, the reticulations very lax, nearly obsolete; petioles 5 to 10 mm long; stipules caducous, oblong-ovate, obtuse, about 3 mm long. Panicles in fruit 2.5 to 5 cm long, peduncled or branched from the base. Fruits obovoid, about 7 mm long, smooth, terete, longitudinally and faintly ribbed, brown when dry. Seeds plano-convex, smooth, the albumen prominently and uniformly ruminant throughout.

LUZON, Ilocos Norte Province, Bangui, *Bur. Sci.* 27456 (type), 27459, 27544 Ramos, February, 1917, in thickets and forests at low altitudes.

The alliance of this species is manifestly with *Grumilea luconensis* (Cham.) F.-Vill., from which it is readily distinguished by its differently shaped, fewer-nerved leaves.

PSYCHOTRIA Linnaeus

PSYCHOTRIA DEPAUPERATA sp. nov.

Frutex erectus, circiter 0.5 m altus, ramosus, partibus junioribus et subtus foliis ad costa ferrugineo-pubescentibus; foliis anguste oblongis ad oblongo-lanceolatis, usque ad 7 cm longis, utrinque subaequaliter angustatis, acutis vel obscure acuminatis, nervis tenuibus, utrinque circiter 10; fructibus in axillis superioribus, solitariis, obovoideis, obscure sulcatis, glabris, circiter 6 cm longis; seminibus concavo-convexis, albumine aequabile.

An erect, much-branched undershrub about 0.5 m high, the branchlets, petioles, and midribs on the lower surface of the leaves ferruginous-pubescent. Branches terete, grayish or brownish. Leaves firmly chartaceous, narrowly oblong to oblong-lanceolate, 3 to 7 cm long, 10 to 17 mm wide, subequally narrowed to the acute base and apex, or the apex slightly acuminate, subolivaceous when dry, the upper surface glabrous, shining, the lower much paler, ferruginous-pubescent on the midrib, otherwise glabrous; lateral nerves about 10 on each side of the midrib, slender; petioles ferruginous-pubescent, about 5 mm long. Fruits in the uppermost axils, solitary, glabrous, yellow when fresh, brown when dry, narrowly obovoid, about 6 mm long, apex rounded, base cuneate, obscurely sulcate when dry; seeds concavo-convex, the back with 3 or 4 shallow longitudinal ridges, the albumen not at all ruminate; pedicels about 6 mm long, recurved, sparingly pubescent.

ALABAT, back of Sangirin, *Merrill 10487*, December 23, 1916, on dry ridges in virgin forest, altitude about 100 meters; of very local occurrence.

The alliance of this species is manifestly with *Psychotria linearis* Bartl. (*Amaracarpus longifolius* Elm.), from which it is at once distinguished by its entirely differently shaped leaves.

PSYCHOTRIA SAMARENSIS sp. nov.

Arbor circiter 5 m alta, ramulis subtus foliis et inflorescentiis prominente ferrugineo-pubescentibus; foliis oblongis, firmiter chartaceis, usque ad 15 cm longis, utrinque subaequaliter angustatis, apice acuminatis, basi acutis, supra in siccitate castaneis, subtus pallidioribus, nervis utrinque 10 ad 12; infructescentiis 5 ad 7 cm longis, breviter pedunculatis vel e basi ramosis; fructibus sessilibus, anguste obovoideis, haud sulcatis, leviter pubescentibus; seminibus plano-convexis.

A tree about 5 m high, the branchlets, lower surface of the leaves, petioles, and inflorescences prominently ferruginous-pubescent. Branches terete, slender, glabrous, smooth, pale-brownish when dry. Leaves firmly chartaceous, oblong, 11 to

15 cm long, 3 to 4 cm wide, castaneous when dry, subequally narrowed to the acuminate apex and the acute base, the upper surface shining, glabrous, the lower paler, with short, rather scattered hairs over the entire surface; lateral nerves 10 to 12 on each side of the midrib, rather prominent on the lower surface; petioles pubescent, 1.5 to 2 cm long; stipules deciduous. Panicles densely ferruginous-pubescent, in fruit 5 to 7 cm long, shortly peduncled or branched from the base, the branches 3 to 5, opposite, spreading, the fruits sessile at the apices of the primary branches, two or more fruits on each branch. Fruits red when fresh, when dry dark brown, narrowly obovoid, about 8 mm long, not at all sulcate, the upper part more or less ferruginous-pubescent. Seeds plano-convex, the albumen not at all ruminant.

SAMAR, Salcedo, *For. Bur. 23576 Lasquety*, March 11, 1915, on ridges, altitude about 200 meters.

This species is characterized by its brown indumentum, its oblong leaves, and its narrowly obovoid fruits, which are sessile and somewhat fascicled at the tips of the primary branches of the infructescences. It does not appear to be closely allied to any other described Philippine form.

PSYCHOTRIA CADIGENSIS sp. nov.

Frutex scandens, glaber, ramis ramulisque teretibus, griseis vel brunneis; foliis chartaceis, oblongis vel oblongo-ovatis, usque ad 10 cm longis, prominente tenuiter acuminatis, basi acutis, supra olivaceis, subtus pallidis, nitidis, nervis utrinque 8 vel 9, prominentibus; paniculis axillaribus terminalibusque, laxis, diffusis, pedunculatis, usque ad 10 cm longis; fructibus oblongo-ellipsoideis, circiter 5 mm longis, obscure longitudinaliter sulcatis.

A scandent, entirely glabrous shrub, the branches and branchlets terete, brown or grayish, smooth, the internodes 3 to 8 cm long. Leaves chartaceous, oblong to oblong-ovate, 7 to 10 cm long, 2.5 to 4 cm wide, the apex prominently and slenderly acuminate, the base acute, the upper surface olivaceous, the lower much paler, shining; lateral nerves 8 or 9 on each side of the midrib, prominent on the lower surface, here brownish in contrast with the pale epidermis, curved, anastomosing, the reticulations nearly obsolete; petioles 5 to 7 mm long; stipules deciduous. Panicles up to 10 cm long, peduncled, lax, diffuse, the branches few, opposite, up to 4 cm in length. Fruit white when fresh, oblong-ellipsoid, about 5 mm long, brownish when dry and obscurely longitudinally sulcate.

LUZON, Tayabas Province, Mount Cadig, *Bur. Sci. 25484* (type), 25533 Yates, December, 1916, in forests, altitude 350 to 500 meters.

This species resembles *Psychotria diffusa* Merr., to which it is certainly

allied. It differs, however, in its larger leaves, which are pale beneath, and in being entirely glabrous throughout.

PSYCHOTRIA PAUCINERVIA sp. nov.

Frutex scandens, glaber, ramis teretibus, rubro-brunneis; foliis ellipticis ad oblongo-ellipticis, chartaceis vel subcoriaceis, nitidis, olivaceis vel viridis, usque ad 6 cm longis, utrinque subaequaliter angustatis, basi acutis, apice prominente acuminatis, nervis utrinque 5 vel 6, tenuibus, distinctis; stipulis membranaceis, oblongis, acuminatis, caducis, 8 ad 10 mm longis; paniculis pedunculatis, laxis, diffusis; fructibus ovoideis, succulentis, 5 ad 7 mm longis; seminibus plano-convexis, dorso obscurissime 3-sulcato, albumine aequabile.

A scandent, entirely glabrous shrub, the branches terete, about 2.5 mm in diameter, shining, reddish-brown, slightly wrinkled. Leaves elliptic to oblong-elliptic, chartaceous to subcoriaceous, olivaceous to greenish when dry, of about the same color on both surfaces, shining, 5 to 6 cm long, 2 to 3 cm wide, subequally narrowed to the acute base and the prominently acuminate apex, the acumen nearly 1 cm long, blunt to subacute; lateral nerves 5 or 6 on each side of the midrib, slender, anastomosing, somewhat curved and ascending, the reticulations very lax; petioles slender, 4 to 8 mm long, stipules caducous, oblong, membranaceous, acuminate, 8 to 10 mm long. Panicles terminal, peduncled, lax, up to 10 cm long, the branches few, the primary ones about 4 cm long. Fruits succulent and white when fresh, when dry dull-brownish, ovoid, 5 to 7 mm long. Seeds plano-convex, the back obscurely and shallowly 3-sulcate, the ridges rounded, the pyrenes about 3.5 mm long; albumen uniform.

LUZON, Abra Province, Mount Posuey, *Bur. Sci.* 27055 Ramos, February 4, 1917, near the summit of the mountain in forests.

A species characterized by its few-nerved leaves; long, caducous stipules; lax infructescences; and succulent fruits, which are white when fresh, the pyrenes being relatively small. In some respects it seems to approach *Psychotria mindorensis* Elm., but it has differently shaped, fewer-nerved leaves and does not appear to be especially closely allied to that species.

[The Philippine Journal of Science, Vol. XII, Sec. C, No. 2, including pages 73 to 116, was issued August 14, 1917.]

PUBLICATIONS FOR SALE BY THE BUREAU OF SCIENCE, MANILA, PHILIPPINE ISLANDS—Continued

BOTANY

A FLORA OF MANILA

By ELMER D. MERRILL

Order No. 419. Paper, 490 pages, \$2.50, postpaid.

Practically a complete flora of the cultivated areas in the Philippines. Descriptions, with keys, of over 1,000 species, 590 genera, and 136 families, with native names, glossary of technical terms, etc.

PHILIPPINE DIPTEROCARP FORESTS

By WILLIAM H. BROWN and DONALD M. MATTHEWS

Order No. 432. Paper, 150 pages, 1 map, 13 plates, and 12 diagrams, \$1.00, postpaid.

In Philippine Dipterocarp Forests the authors present a very comprehensive discussion of the growth and development of dipterocarp trees and of the other elements of lowland Philippine forests.

INDO-MALAYAN WOODS

By FRED W. FOXWORTHY

Order No. 411. Paper, 182 pages, 9 plates, \$0.50, postpaid.

In Indo-Malayan Woods, Doctor Foxworthy has brought together a large amount of accurate information concerning trees yielding woods of economic value.

ZOOLOGY

A LIST OF MAMMALS OF THE PHILIPPINE ISLANDS, EXCLUSIVE OF THE CETACEA

By NED HOLLISTER

Order No. 413. Paper, 64 pages, \$0.50, postpaid.

The distribution of each species is given, and the original descriptions are cited.

ZOOLOGY—Continued

A MANUAL OF PHILIPPINE BIRDS

By RICHARD C. MCGREGOR

Order No. 103. Paper, 2 parts, 769 pages, \$4, postpaid.

A Manual of Philippine Birds contains in compact form descriptions of all the known species of Philippine birds. The usual keys and diagnoses of orders, families, and genera help the novice in identification.

A CHECK-LIST OF PHILIPPINE FISHES

By DAVID STARR JORDAN and ROBERT EARL
RICHARDSON

Order No. 102. Paper, 78 pages, \$0.75, postpaid.

This list will be found a convenient guide to the synonymy of Philippine ichthyology. The nomenclature is thoroughly revised, and the distribution of each species within the Philippine Islands is given.

A CATALOGUE OF PHILIPPINE COLEOPTERA

By W. SCHULTZE

Order No. 436. Paper, 198 pages, \$1.00, postpaid.

This catalogue includes the names of all species of Coleoptera that have been recorded from a definite locality in the Philippine Islands. References to original descriptions and other important notes are given. The economic appendix includes comment on those species of beetles which are known to be injurious or beneficial to man.

PRICES ARE IN UNITED STATES CURRENCY

Orders for these publications may be sent to the BUSINESS MANAGER, PHILIPPINE JOURNAL OF SCIENCE, BUREAU OF SCIENCE, MANILA, P. I., or to any of the agents listed below. Please give order number.

The Macmillan Company, 64-66 Fifth Avenue, New York, U. S. A.
Wm. Wesley & Son, 28 Essex Street, Strand, London, W. C., England.
Martinus Nijhoff, Lange Voorhout 9, The Hague, Holland.
Mayer & Müller, Prinz Louis Ferdinandstrasse 2, Berlin N. W., Germany.
Kelly & Walsh, Ltd., 32 Raffles Place, Singapore, Straits Settlements.
A. M. & J. Ferguson, 19 Raillie Street, Colombo, Ceylon.
Thacker, Spink & Co., P. O. Box 54, Calcutta, India.

CONTENTS

	Page.
MERRILL, E. D. Two new genera and four new species of Philippine Compositae.....	117
MERRILL, E. D. New Philippine Lauraceae.....	125
MERRILL, E. D. New Philippine Myrsinaceae.....	143
MERRILL, E. D. Studies on Philippine Rubiaceae, III.....	159

	U. S. currency.
The "Philippine Journal of Science" is issued as follows:	
Section A. Chemical and Geological Sciences and the Industries..	\$2.00
Section B. Tropical Medicine	3.00
Section C. Botany	2.00
Section D. General Biology, Ethnology, and Anthropology (Sec- tion D began with Volume V).....	2.00
Entire Journal, Volume II, III, IV, or V	5.00
Entire Journal, beginning with Volume VI	7.00
Single numbers (except of Volume I)50
<i>Each section is separately paged and indexed.</i>	
<i>Authors receive 100 copies of their papers free.</i>	
Volume I, 1906 (not divided into sections) and supplement, sold only with a complete file of section A, B, or C.....	10.00
Supplement to Volume I (botany)	3.50
Volume I (without supplement), sold only with a complete file of section A, B, or C.....	6.50
Single numbers of Volume I75

Publications sent in exchange for the Philippine Journal of Science should be addressed: Library, Bureau of Science, Manila, P. I.

Subscriptions may be sent to the BUSINESS MANAGER, Philippine Journal of Science, Bureau of Science, Manila, P. I., or to any of the agents listed below:

AGENTS

The Macmillan Company, 64-66 Fifth Avenue, New York City, U. S. A.
 Wm. Wesley & Son, 28 Essex Street, Strand, London, W. C., England.
 Martinus Nijhoff, Lange Voorhout 9, The Hague, Holland.
 Mayer & Müller, Prinz Louis Ferdinandstrasse 2, Berlin, N. W., Germany.
 Kelly & Walsh, Limited, 32 Raffles Place, Singapore, Straits Settlements.
 A. M. & J. Ferguson, 19 Baillie Street, Colombo, Ceylon.
 Thacker, Spink & Co., P. O. Box 54, Calcutta, India.